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UTOPIAN THOUGHT: THE HISTORICAL AND CULTURAL SIGNIFICANCE OF SELECT GERMAN TECHNOLOGICAL UTOPIAS, 1890-1945

by

© MARGARET TUCKER

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Utopian Thought: The Historical and Cultural Significance of Select German Technological Utopias, 1890-1945," submitted by Margaret Tucker in partial fulfilment of the requirements for the degree of Master of Arts.

Helen Liebel-Weckowicz
Supervisor

Patricia E. Prestwich

Alison Scott-Prelorentzos

Date September 25, 1980.

DEDICATION

TO MY PARENTS, REV. NEVIL TUCKER AND
DORA GREER-TUCKER, R.N., WHO INTRODUCED ME
TO THE WORLD OF THE STARSHIP ENTERPRISE

ABSTRACT

In awareness of the profusion of twentieth century German science fiction, the primary concern of this study was to investigate some representative works in order to answer the question: what is the historical and cultural significance of select German examples from this now popular literary genre? To enlighten the reader about the nature of utopian and science fiction literature, the introduction gave a brief bibliographical survey of noteworthy primary and secondary works in the field. Both contributions and shortcomings of the perspectives offered by the secondary sources were examined in an effort to draw the reader's attention to the need for a study of modern German science fiction within the context of utopian thought. The introduction also served as a way of defining the new terms used in the study, and as a means of bringing the reader to focus on the thesis, which is: select examples of modern (1890-1945) German science fiction are historically and culturally significant because they are representative of "technological utopias."

In order to demonstrate this significance, it was necessary to show that these examples of German fiction were in fact a form of utopian literature. More specifically, it was necessary to show that they were characteristic of a form described as "technological utopian literature," and representative of a unique European technological utopian tradition that included certain works by Plato, Roger Bacon, Valentin Andreae, Francis Bacon, Condorcet, and H. G. Wells. To address the question of the literature's utopian nature, a "functional" model of technological utopianism was created. It was considered functional in the sense that the model defined the nature of such a utopianism.

As applied, it could be used to determine whether or not science fiction works warranted classification as technological utopias. It could also enable one to distinguish mere social satires, fables (Märchen), and scientifically-orientated yet non-science fiction literature from true technological utopias.

In chapter one, the utopian ideas of Karl Mannheim and Ernst Bloch were examined, criticized, and elaborated upon in order to devise the necessary technological utopian prototype. In chapter two, this was applied to representative scientific utopian works by Plato, Valentin Andreae, and H. G. Wells. Such topics as (1) women, (2) scientific and political elites, (3) science, and (4) interregional and international politics were examined. This was done in order (a) to test the model's validity on famous and reputable scientific utopias, and (b) to demonstrate that these works satisfied the model's criteria and, in consequence, could be classified as technological utopias within the framework of a "philosophical" technological utopian or science fiction tradition. In chapter three, the model was applied to select examples of modern German science fiction by Kurd Lasswitz, Otto Willi Gail, and Hans Dominik. The same four subjects were again looked at in order (a) to show that these works, too, fulfilled the demands of the prototype and were true technological utopias, and (b) to demonstrate that such works belonged to the distinct European technological utopian heritage as "literary," rather than "philosophical," utopian science fiction. Chapter four interpreted the results of the analysis in the light of arguments regarding the nature of utopianism and science fiction. It was concluded that these examples of modern German science fiction, as "model" technological utopias like their utopian predecessors, could be considered of historical and cultural significance.

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INTRODUCTION

> A map of the world that does not include Utopia is not worth even glancing at, for it leaves out the one country at which Humanity is always landing. And when Humanity lands there, it looks out, and, seeing a better country, sets sail. Progress is the realization of Utopias.
>
> Oscar Wilde,
> The Soul of Man under Socialism

This often quoted passage is an appropriate introduction to an area of human thought that is at once profound in content and diverse in variety. The primary literature about utopian thought includes both early and modern varieties of utopianism. These offer religious, political, and social solutions to determine the goal of a new and "better" society. Socio-religious answers to the question of man's existence are considered in the Bible itself, as well as in such famous mediaeval works as St. Augustine's City of God.[1] Socio-political responses to the problem of achieving the "best" society range from famous Renaissance representatives, like Thomas More's Utopia,[2] to more obscure eighteenth and nineteenth century German works, like Franz Callenbach's Wurmland, Paul Jakob Marperger's Abbildung, Philip Wasserburg's Etwas Später, and Lagar Hellenbach's Die Insel Mellonta.[3] Science and technology are also looked upon as means to solve man's social woes. Evidence of this is found in Campanella's City of the Sun[4] and modern science fiction.

In spite of, or perhaps because of the vast number of utopias, the secondary literature presents a wide spectrum of opinions on the relative usefulness of this mode of thinking. Briefly, these range from the highly negative to the more appreciative. Karl Popper, for instance, opposes what he considers to be the deterministic nature of utopianism, which restricts man's future within the confines of a pre-formed plan. He argues that "instead of posing as prophets we must become makers of our fate."[5] Other students of utopian thought,[6] in contrast, appreciate its positive value. Far from suggesting that utopias deny human input, and accompanying this, the creation of our own fate, they see a definite "need" for utopias, to present social alternatives for the future, to inspire man to reach out beyond his present state, and to prevent man's social and creative stagnation. These writers also acknowledge that utopian literature may be historically and culturally valuable, as indicators of the temper of the times and as works that offer social and political comment on the contemporary society. Ralf Dahrendorf, for example, maintains that "... the purpose underlying utopian constructions has been one of criticism, even indictment of existing societies."[7]

Equally diverse are the various approaches to the nature of utopian thought taken in the secondary works. There is a consensus that variety is an aspect of its nature, and can be found in the general forms of utopias, whether religious or socio-political, in the means employed to achieve the goal, whether political, social, revolutionary, or non-violent, as well as in the social or political elite that maintain the utopian goal. The different approaches taken in the literature enhance these basic varieties and add to one's understanding of the topic. Paul Tillich,[8] for example, emphasizes the religious-metaphysical, indeed existential nature of utopian thought. Glenn Negley[9] approaches it from a socio-political perspective. Professor Negley contends that "the history of utopias is a history of social, intellectual, and political development."[10] Frank Manuel[11] recognizes its socio-political nature, but defines utopianism in psychological terms, in terms of dreams and private desires. Lewis Mumford's dated, yet classic apologia for utopian thought also looks at its social and political aspects. His study, however, is more sociologically relevant because of his attention to the role of social, political, as well as scientific values. He claims that, in the reconstructive type of utopia, the utopian thinker seeks to change the environment and "by a reconstructed environment I do not mean merely a physical thing. I mean, in addition, a new set of habits, a fresh scale of values ...."[12] While Mumford stresses change in social and political "values" as the pathway to utopia, Nell Eurich focuses on the scientific means by which man has constantly hoped to reach "happiness and a better life."[13]

The secondary literature briefly surveyed here contributes to one's understanding of the nature, depth, and types of utopian thought. Yet these typological studies remain incomplete. The majority of writers acknowledge only the religious and socio-political messages inherent in many utopias. Of those who do recognize the important position accorded science in pre-twentieth century utopias, as a means to the goal of the "better life," most (like Nell Eurich) place this scientific type within the context of the socio-political variety. None of these writers concedes that the pervading scientific and technological means employed to reach and maintain the utopian goal, as well as the dominant scientific and engineering elite, may determine a unique type of utopia. Consequently, not one subscribes to the notion of a distinct scientific or "technological utopian" variety, in the vein of Francis Bacon's New Atlantis,[14] or even acknowledges modern science fiction within the utopian context. Others have examined twentieth century scientific (science fiction) literature. Of these, however, Judith Shklar, Margaret Mead, and Glenn Negley[15] dismiss science fiction as childish vulgarizations for the mass. Hans-Jürgen Krysmanski[16] denies science fiction utopian status and its European ancestry by suggesting that it is simply a popular American genre, quite unrelated to the modern German Zukunftsroman and European Staatsroman.

In contrast, Martin Schwonke examines modern German science fiction within the context of utopian thought, and suggests that it does belong to the earlier utopian or Staatroman tradition. Yet Schwonke fails to distinguish a specific early-to-modern scientific utopian type and tradition. Like E. M. Kretzmann, he confuses the early and modern didactic science fiction, or scientific utopian tradition, with social satire, Märchen, mythology, and trite historically insignificant literature.[17] The need, then, to demonstrate that science and technology, no less than religion and politics, have often played a salient role in utopian thought, both as means to actualize the goal and as determinants of the variety of utopia itself, prompted this study. The need, moreover, to examine German science fiction within the context of utopian thought, leads us to consider modern literary examples as representative of a distinct early-to-modern European scientific or, what shall be described as a, "technological utopian"[18] heritage. This includes works by Plato, Roger Bacon, Valentin Andreae, Francis Bacon, Condorcet, and H. G. Wells, and excludes social satire and fables (Märchen).

The primary purpose of this thesis, therefore, is to attempt to overcome the prejudice towards the value of modern German science fiction, and also to clarify its true nature, by demonstrating that, as representative technological utopias, select examples of this fiction are historically and culturally significant. What is "modern" in this sense, pertains to the German science fiction produced between 1890 and 1945. To demonstrate their significance, we must address the question of their utopian nature. We must show that these works actually represent a characteristic utopian literature, and a unique European technological utopian tradition. Procedure dictates the design of a "functional" technological utopian "model." Functional means that such a model would serve to define the nature of technological utopianism. It can, in consequence, be employed to determine whether or not a work of science fiction is qualified to be called a technological utopia, and used to distinguish true technological utopian literature from mere satire, Märchen, mythology, and novels that also offer scientific content, yet are not science fiction.

To devise such a prototype, chapter one examines and elaborates upon the utopian ideas of Karl Mannheim and Ernst Bloch.[19] The model, therefore, comprises ideas originated by Mannheim, Bloch, and this author, and is defined in terms of three main aspects. The first makes use of Mannheim's idea of the "sociology of knowledge," which suggests that all thought is the product of the author's social and professional milieu. The second facet acknowledges Mannheim's "liberal-humanitarian" utopian tradition. The third and final part incorporates Bloch's utopian tradition of hope for the future and freedom (Freiheit), which is elaborated upon here to take into account ideas of progress and modernization. In addition, chapter one demonstrates that two major themes, (1) historical change, and (2) intellectual continuity, are inherent in the model-definition of technological utopianism.

Change and continuity are necessarily obvious components of the historical process. In an effort, however, to demonstrate the technological utopian nature of the literature to be examined, and in order to show the presence of a technological utopian tradition, the attempt is made in the following two chapters to show "how" and "why" changes in outlook are expressed, while a sense of historical and utopian continuity is maintained. In chapter two, this model is applied to select works by Plato (the Republic, the Timaeus, and the Critius), Johann Valentin Andreae (Christianopolis), and H. G. Wells (A Modern Utopia, and Anticipations). The specific social, scientific, and political topics of: (1) women, (2) scientific and political elites, (3) science, both theoretical and practical, and (4) interregional and international politics are then examined. This procedure will be carried out in order, first, to initially test the model on well-known and reputable scientific utopias, second, to validate the applicability of the model by demonstrating, using these four representative topics as test subjects, that these works satisfy the model criteria of change and continuity, and third, to show the existence of an ancient to modern European technological utopian tradition or, more accurately, a "philosophical" technological utopian heritage. By philosophical is meant that the works are composed in the form of a dialogue, rather than that of a modern novel, and consider science and technology both at the theoretical and practical levels.

In chapter three, the model is applied to select works of modern German science fiction[20] by Kurd Lasswitz (Two Planets), Otto Willi Gail (By Rocket to the Moon. The Story of Hans Hardt's Miraculous Flight, The Shot into Infinity, and Der Stein vom Mond), and Hans Dominik (Treibstoff SR). The same four subjects are examined. This procedure is repeated, again to verify the applicability of the prototype by showing that these novels also satisfy the model criteria of change and continuity, and second, to demonstrate that these works, too, belong to the European technological utopian heritage or, more precisely, a modern "literary" tradition. Literary means that the works are written in the style of a modern novel rather than a philosophical treatise. They are literary, moreover, in the sense that the contents emphasize the practical and applied aspects of science and technology, not its theory. Although not devoid of theoretical considerations, the contents glorify the achievements of practical men of application (such as engineers), who use the epistemological methods described by Plato, Andreae, and Wells to create the new technologically-orientated society. Chapter four interprets the findings of the study in the light of arguments regarding the nature of utopianism and science fiction. It clarifies the nature of technological utopianism and science fiction, and suggests that the early philosophical technological utopias looked at can be considered representative of philosophical science fiction, just as the modern German examples of literary science fiction studied can be classified as literary technological utopias. Chapter four concludes that the modern German science fiction examined, like its utopian predecessors, is of historical and cultural significance.

FOOTNOTES

INTRODUCTION

[1] St. Augustine, The City of God, trans. by Marcus Dods, D.D.; Books iv, xvii, and xviii translated by the Rev. George Wilson, Glenluce; Books v, vi, vii, and viii by the Rev. J. J. Smith, intro. by Thomas Merton, The Modern Library (New York: Random House Inc., 1950).

[2] Thomas More, "Utopia," in Famous Utopias. Being the Complete Text of Rousseau's Social Contract, More's Utopias, Bacon's New Atlantis, Campanella's City in the Sun, intro. Charles M. Andrews (New York: Tudor Publishing Co., 1950), pp. 129-232. Yet another noteworthy sixteenth century English socio-political utopia is: Edmund Dudley's The Tree of Commonwealth. A Treatise, ed. with an intro. by D. M. Brodie (Cambridge: Cambridge University Press, 1948).

[3] Franz Callenbach, Wurmland / Nach Lands-Art / Regiment / Religion / Sitten und Lebens-Wandel / Gleichsam auff einer Schaubühn vorgestellet allen nach Beschaffenheit deren / entweder angebohrnen / oder angedehnten / oder ererbten Wurmb-Köpff / Stand-Mässig geehrten Lands-Kindern / Regiments-Gliedern / Beamten / Ober-und-Unter-Officieren / Bürgern / Soldaten / Künstler und Handwerks:Leuthen / Bauren / Landstreichern / Bettlern zur heilsamen Nachricht herausgeben. Und zu finden bey der Wurmschneiders / Zunfft / Bey Vermelio Wurmsaam Im Gast-Haus zum Regenswurm. Im Jahr / da es Wurmsichtig war (1712, 1714), 144 pp.; Paul Jakob Marperger's Abbildung einer / nach allem natürlichen / und politischen / auch policey-cammer-commercien-und oeconomie-requisitis wohlbestellten / und mehrentheils ... vollkommenen republic, ohne dass man dessfalls auf eine platonische / utopische oder severambische u. zu. verfallen ursach habe ... (Dresden, 172?), 48 pp; Philipp Wasserburg (Philipp Laicus), Etwas Später! Fortsetzung von Bellamys Rückblick aus dem Jahre 2000 (Mainz: Verlag von Franz Kirchheim, 1891); and Lagar B. Hellenbach, Die Insel Mellonta. Seitenstück zu Bellamys 'Rückblick auf das Jahr 2000', Dritte Auflage (Leipzig: Oswald Mutze Verlag, 1896).

[4] Tommaso Campanella, "The City in the Sun," in Famous Utopias, pp. 275-317.

[5] Karl Popper, The Open Society and its Enemies, vol. 2: The High Tide of Prophesy: Hegel, Marx and Aftermath (Princeton: Princeton University Press, 1966; Princeton Paperback, 1971), p. 280. This contempt for the utopian mentality is also expressed in his The Poverty of Historicism (London: Routledge and Kegan Paul Ltd., 1957; paperback ed., 1961), passim.

[6] See, for example, Paul Tillich, Politische Bedeutung der Utopie im Leben der Völker, intro. Otto Suhr (Berlin: Gebrüder Weiß Verlag, 1951), passim; Arthur Morgan, Nowhere was Somewhere. How History Makes

Utopias and How Utopias Make History (Chapel Hill: University of North Carolina Press, 1946), p. 5; Margaret Mead, "Towards More Vivid Utopias," in *Utopia*, ed. George Kateb (New York: Atherton Press, 1971), pp. 46-47; Frederik Polak, *The Image of the Future*, trans. and abridged by Elise Boulding, foreword by Kenneth Boulding (San Francisco: Jossey-Bass Inc., Publishers, 1973), passim; and Helmut Swoboda, *Utopie. Geschichte der Sehnsucht nach einer besseren Welt* (Wien: Europa Verlags-AG., 1972), pp. 8, 37.

[7] Ralf Dahrendorf, "Out of Utopia: Toward a Reorientation of Sociological Analysis," in *Utopia*, p. 114.

[8] Tillich, passim. Roland Stromberg, in his *An Intellectual History of Modern Europe*, 2nd ed. (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1975), p. 467, suggests that Tillich, as a member of a group of post- World War One Christian existentialists, saw the need to "return to orthodoxy." He thus approached utopian thought from a conservative perspective, interpreting it in religious-metaphysical terms.

[9] Glenn Negley and J. Max Patrick, comp., introduction to *The Quest for Utopia: An Anthology of Imaginary Societies* (New York: Henry Schuman Inc., 1952). Others who examine utopias from a socio-political perspective include: Hans Freyer, *Die politische Insel. Eine Geschichte der Utopien von Platon bis zur Gegenwart* (Leipzig: Bibliographisches Institut AG., 1936); and Arthur von Kirchenheim (pseud.), *Schlaraffia Politica. Geschichte der Dichtungen vom besten Staate* (Leipzig; Verlag von Fr. Wilhelm Grunow, 1892; reprint ed., Amsterdam: Liberac N.V. Publishers, 1967). Moreover, Evelyn Beck, in "Frauen, Neger und Proleten. Die Stiefkinder der Utopie," in *Deutsches utopisches Denken in 20. Jahrhundert*, herausgegeben von Reinhold Grimm und Jost Hermand (Stuttgart: Verlag W. Kohlhammer, GmbH., 1974), pp. 30-50, and Lawrence Baren, et al., in "Der 'anarchische' Utopismus der westdeutschen Studentbewegung," in *Deutsches utopisches Denken in 20. Jahrhundert*, pp. 120-136, suggest that women's and students' movements are unique utopian forms. Actually, however, these are part of the social and political utopian vision, and not in themselves unique types. That is, both promote and employ social and political means to attain the goal and must, therefore, be classified as varieties of the socio-political utopia.

[10] Negley, *The Quest for Utopia*, p. 8.

[11] Frank E. Manuel, "Toward a Psychological History of Utopias," in *Utopias and Utopian Thought*, ed. and intro. by Frank E. Manuel (Boston: Houghton Mifflin Co., 1966), pp. 69-98.

[12] Lewis Mumford, *The Story of Utopias*, intro. by Hendrik Willem van Loon (New York: Boni and Liverright, 1922; reprint ed., Gloucester, Mass.: Peter Smith, 1959), pp. 21-22, passim.

[13] Nell Eurich, *Science in Utopia: A Mighty Design* (Cambridge, Mass.: Harvard University Press, 1967), p. 8.

[14] Francis Bacon, "New Atlantis," in Famous Utopias, pp. 233-72. Nell Eurich considers this a socio-political utopia offering scientific content. She does not assign terms like technical utopia or science fiction to this work.

[15] Judith Shklar, "The Political Theory of Utopia: From Melancholy to Nostalgia," in Utopias and Utopian Thought, p. 106; Mead, p. 52; Glenn Negley, comp., introduction to Utopian Literature. A Bibliography with a Supplementary Listing of Works Influential in Utopian Thought (Lawrence, Kansas: The Regents Press of Kansas, 1977), p. xii.

[16] Hans-Jürgen Krysmanski, Die utopische Methode. Eine literatur- und-wissenssoziologische Untersuchung deutscher utopischer Romane des 20. Jahrhunderts, Dortmunder Schriften zur Sozialforschung, Band 21 (Köln: Westdeutscher Verlag, 1963), pp. 1-4, passim.

[17] Martin Schwonke, Vom Staatsroman zur Science Fiction. Eine Untersuchung über Geschichte und Funktion der naturwissenschaftlich-technische Utopie (Stuttgart: Ferdinand Enke Verlag, 1957), pp. 57-76; and E. M. J. Kretzmann, "German Technological Utopias of the Pre-War Period," Annals of Science 3, no. 4 (1938): 430-31. Zoe L. Treguboff, in her "A Study of the Social Criticism in Popular Fiction: A Content Analysis of Science Fiction" (Ph.D. dissertation, University of California: Los Angeles, 1955), also recognizes the value of science fiction, specifically American science fiction. She, however, looks at science fiction purely in terms of social literature rather than from a utopian perspective.

[18] This author did arrive at the term, "technological utopia," independently. However, both E. M. J. Kretzmann and Howard P. Segal, in his "Technological Utopianism and American Culture, 1830-1940" (Ph.D. dissertation, Princeton University, 1975), have also made use of these words to describe that literature that employs science and technology as means to a better life. Segal, moreover, argues that works of science fiction do not represent examples of technological utopianism (pp. 1-2, 10). In contrast, this author contends that a certain level of quality or serious science fiction, specifically German science fiction, can be considered as technological utopian. Segal's somewhat restrictive definition of technological utopianism, as well as his views on early scientific utopias and modern science fiction, will be taken up in more detail on appropriate occasions in chapters two, three, and four (the conclusions).

[19] Karl Mannheim, Ideology and Utopia, foreword by Lewis Wirth and Edward Shils, preface by Louis Wirth (London: Routledge and Kegan Paul, 1936; paperback ed., 1976); and Ernst Bloch, Das Prinzip Hoffnung, 3 vols. (Frankfurt-am-Main: Suhrkamp Verlag, 1959).

[20] The literature to be examined here looks at science in a positive light, as a means of achieving a better world for mankind. German "dystopias" and "cacotopias," or works that present science and technology as negative forces, means to create a totalitarian state or a biologically and genetically engineered and controlled society (in the vein of George Orwell's Nineteen Eighty-Four or Aldous Huxley's Brave New World), are neither examined nor considered genuine technological utopias.

CHAPTER ONE

THE UTOPIAN MODEL:

The Philosophical Foundations of Technological Utopianism

Arthur Morgan[1] claims that the model for utopian thought cannot be represented by any one work, such as More's Utopia, while Georges Duveau and Helmut Swoboda insist that attempts to define utopia are illusory.[2] Nevertheless, while one literary effort may not provide a precise model for utopian thought, this does not exclude the possibility that a model and thereby a definition of the utopian mentality can be constructed. To fulfil the need for a utopian model, more specifically a technological utopian frame of reference, this author aims to devise a model that elaborates upon and synthesizes the ideas of Karl Mannheim and Ernst Bloch.

PART I

KARL MANNHEIM AND ERNST BLOCH: Their Models of Utopian Thought

In the past twenty-five years, the work of Karl Mannheim and Ernst Bloch have enjoyed a significant revival and have once more become methodologically important for studying both ideology and utopianism. Karl Mannheim (1893-1947), although born in Budapest, was renown as a German sociologist. His academic studies began in Budapest before he moved on to the universities at Berlin, Paris, and Freiburg. His teaching career started at Heidelberg in 1926. He then took a post as professor of sociology at Frankfurt-am-Main, before accepting the position of lecturer in sociology at the London School of Economics in

1933. Throughout these years, but especially during his years at Heidelberg, he came under the intellectual influence of such diverse schools of thought as German Idealism and Marxism, as well as the historicist and sociological tradition of men like Comte, Ranke, Dilthey, Durkheim, and perhaps most influential, Max Weber.[3] His own sociology in fact reveals itself to be a product of this triple intellectual heritage. In the tradition of historicism and Marxism, he concerned himself with the concept of determinism, specifically the deterministic nature of thought. While Mannheim himself was not a Marxist,[4] he nevertheless appreciated Marxist presuppositions regarding the social determinants of human action and thought.

Ernst Bloch (1885-1977), on the other hand, whose academic background was in philosophy and physics, was of a Marxist persuasion. His career began as a free lance writer in Munich, Bern, and Berlin. He then sojourned in the United States (1938-1949) before accepting a position in the department of philosophy at the University of Leipzig in East Germany. Subject, however, to publishing difficulties as editor of a comparatively independent journal, the Deutsche Zeitschrift für Philosophie, Bloch sought political asylum in West Germany. From 1961 until his death, he was visiting professor at the University of Tübingen. His principal work, Das Prinzip Hoffnung, which examines his utopian ideas fully, was published in 1959 during his period in East Germany.[5]

Although Bloch and Mannheim held different positions in the socio-political spectrum, both shared certain ideas regarding the nature of utopian thought. Both, for example, acknowledge the "need" for utopias.[6] Utopianism, according to Mannheim, is bound up with the process of becoming,[7] and this sense of the future, this sphere of new possibilities, is necessary to stimulate man's social development and prevent "the decay of the human will" and the emergence of "matter-of-factness"[8] in life. Bloch conveys a similar sentiment when he maintains that "man braucht das stärkste Fernrohr, das des geschliffenen utopischen Bewußtseins, um gerade die nächste Nähe zu durchdringen."[9] They also recognize the value of humanism in the utopian mentality, and its opposition to the exploitation of man by man. Bloch makes manifest his awareness of this opposition when he states that: "Schiffermärchen leihen selbst bedeutenden Sozialutopien, so bei Thomas Morus, die Einkleidung; in diesem Rahmen erscheint Glück, lange bevor die Zeiten dazu reif waren; seit mehr als zweitausend Jahren ist in Utopien die Ausbeutung des Menschen durch den Menschen abgeschafft."[10] One other aspect of their utopian outlooks, however, is perhaps the most important common feature of their utopian models or definitions of utopian thought. Both discern the socially-determined nature of utopian thought and concede that it mirrors a desire for social change, and by implication, offers social criticism as well. Bloch, for instance, insists that utopian thinkers do not vindicate the ruling class. Instead, they advocate the "coming bearers of society" and "the particular tendency to come."[11] As Thomas More anticipated and favoured the coming values of the "freie Handelskapital," in evidence in his sixteenth century England, Campanella looked forward to the "absolutische Manufakturperiode,"[12] just beginning in seventeenth century Italy.

Bloch, a major Marxist philosopher, considered only generally this social and critical nature of utopian thought. Mannheim, a non-Marxist, developed more fully the idea of the deterministic nature of this mode of thinking. In fact, a fascination with the social nature of thought, both utopian and non-utopian, pervades all of Mannheim's works,[13] including those written during the second or British stage of his career. While these later works reveal his interest in social planning and policy, and although certain themes in his earlier and later works are related, the immediate concern here is with his earlier writings, Ideology and Utopia and Wissenssoziologie.[14] These deal specifically with his ideas on the "sociology of knowledge" and utopian thought. His sociology of knowledge, then a relatively new area within the discipline of sociology, represents an attempt to oppose, if not to overcome, German epistemological idealism,[15] notably that of Kant. Starting from a basic Marxist assumption, he contends that thought is formed within a social matrix, not a vacuum; it is "determined" by its spatial and temporal milieu.

Specifically, Mannheim argues that ideas are the product of an observer, who is himself subject to the influences of his time, place, and social or interest group. Being such, they cannot be considered the result of objectivity. To overcome this problem with relativism, his procedure attempts to take into account the fact that the intellectual observer and also the subject of observation are determined by their social milieu. This procedure is "designated as 'relational'."[16] Relationism means "that it lies in the nature of certain assertions that they cannot be formulated absolutely, but only in terms of the perspective of a given situation."[17] The sociology of knowledge, then, and its "relational procedure," is a way of coming to grips, from a social perspective, with how and why men think as they do: "The principal thesis of the sociology of knowledge is that there are modes of thought which cannot be adequately understood as long as their social origins are obscured."[18]

Not only political ideologies, but all forms of thought, whether they consist of social and literary values, concepts such as freedom and liberty, or utopian visions, are determined by their spatial and temporal origins, according to Mannheim, and are meaningful only when observed or considered in their social context. Indeed, he suggests that social or political utopias can be differentiated "according to the historical epoch and social strata ..."[19] of those who espouse the utopian ideals. Thus, one facet of utopian thought suggests that its general nature is socially determined. A second aspect claims that viewpoints expressed are either acceptable to those of the status quo, or stand in opposition to those advocated by the dominant social or political groups. In other words, the utopian mind readily accepts, on the one hand, certain socially determined ideological values and attitudes,[20] while, on the other hand, repels others. This rejection reveals its essentially critical nature, and one that is both "dialectical" and flexible, as well as able to function "as a motor force of social change which directs the activities of groups opposing the given order."[21] As an opposition, the utopian frame of mind transcends the present reality to posit new, even revolutionary social and political goals for the future. Utopian ideas, therefore, cannot be considered "'organically' and harmoniously integrated into the world-view characteristic of the period ...."[22] Variety is yet a third and final facet of his utopian model. Although he recognizes other ideal "political" varieties,[23] he analyses only (1) the chiliastic, (2) the liberal-humanitarian, (3) the conservative, and (4) the socialist-communist ideas of utopia.[24] Each type, moreover, is subject to and determined by its social milieu, as well as by an elite, whether moral-religious, artistic, political, or scientific,[25] which is also influenced by its social matrix. The elite functions as a means to supplant, via revolutionary or parliamentary methods, the dominant power group and its values.[26]

Thus, Mannheim's utopian model consists of three essential parts important to our study. In the first place, his prototype acknowledges that the utopian outlook is determined by the socio-historical circumstance and class of those who advocate the ideals. These socially-determined values and attitudes, furthermore, are subject to change in meaning or quality with time. In the second place, it recognizes that the utopian mentality "accepts" certain socially-determined social and political views and ideologies, while it "rejects" others espoused by the status quo. In the third place, it concedes that utopias can exist in a variety of political forms.

His model is a useful device that aids one's understanding of the nature of utopian thought. It is, however, not a perfect framework. Its greatest weakness is its neo-Marxist assumption that all thought is socially determined and being such, can be understood only in its social context. By accepting this assumption, he opposed the notion that ideas can transcend their social milieu, to become part of that "autonomously developing sequence of ideas"[27] that creates intellectual continuity. By suggesting that utopian-minded groups or individuals hold to a particular Weltanschauung, which is meaningful to and determined by their social circumstance, Mannheim ignored the possibility that individuals, regardless of their social matrix, may reject certain contemporary outlooks. In so doing, they may accept others that transcend time and place and belong to a "supra-historical" world-view, such as an ancient to modern "liberal-humanitarian" utopian tradition or mentality.

The second problem with his utopian model, perhaps due to a weakness in his education, is its neglect of the value of science and technology as utopian means. He attempted to create a "scientific" social model. Yet neither his Ideology and Utopia nor any of his later works[28] deal with the value and force of science and technology as ways of creating a new society, or as means of moulding, manipulating, and influencing the popular element through communications. As Shils points out: "The influence of science and of scientific, research-based technology on social structure passed unnoticed before him."[29] While his sociology of knowledge is not a failure because he ignored the sciences, as Shils claims,[30] his utopian varieties remain inadequate, "squeezed into this Manichaean straight-jacket"[31] of purely socio-political types. His failure to acknowledge the force of science as a utopian means meant he neglected to examine works of literature, either popular novels or philosophical dialogues, that advocate scientific methods to create a better world.

Bloch, on the other hand, ignored neither the historical continuity in utopian thought nor the force of science reflected in popular and more philosophical utopian literature. In the first place, his utopian model emphasizes the notion of historical and utopian process or continuity. His principal utopian work, Das Prinzip Hoffnung, makes clear that:

> Auch die Niederlage des erwünscht guten schlieBt seinen künftig möglichen Sieg solange in sich ein, als in Geschichte und Welt nicht alle Möglichkeiten des Anderswerdens, Besserwerdens erschöpft sind; als eben das Real-Mögliche mit seinem dialektisch-utopischen ProzeB noch nicht zu Ende fixiert ist.[32]

This idea of a utopian "Process" clearly reveals a Marxist influence. The process itself, however, is not economic in nature.[33] Rather it is both cultural and intellectual. In Bloch's terms, it consists of two main aspects, objective possibility or realizability (Möglichkeit) and subjective hope (Hoffnung) for a better life. These two aspects, moreover, are contained, according to Bloch, in both popular and philosophical utopian literature, and so the main theme of Das Prinzip Hoffnung "sind die Träume vom besseren Leben" and in this work, "ihre unvermittelten vor allem aber ihre vermittelbaren Züge und Inhalte werden in Breite aufgenommen, erforscht, geprüft."[34]

Hope,[35] the first major element of his utopian model, creates the tension that stimulates the individual or group to strive forward. Because of its considered functional importance, is "... der Versuch gemacht, an die Hoffnung, als eine Weltstelle, die bewohnt ist wie das beste Kulturland und unerforscht wie die Antarktis, Philosophie zu bringen."[36] Although hope is placed in this transcending "universal position" to create the subject of intellectual unity amongst all utopias, and while it is a rather "Romantic" theme in Bloch's thinking,[37] it is not a Marxist mechanistic interpretation of hope. The "Sinn des Traums nach vorwärts"[38] does not express a notion of inevitability. Instead, it calls for definite human input and optimistic human desires if man is to progress socially, and change. The desired goal "has a human content, not yet manifest: a 'concrete-utopian' human content."[39]

The idea of hope for the future is not fanciful either. It has a precise meaning and function in that the anticipated future is humanly and actively possible, being mediated with existing tendencies: "... der Weltprozeß selber eine utopische Funktion ist, mit der Materie des objektiv Möglichen als Substanz."[40]

The words "objektiv Möglichen" introduce the second major element in his utopian model, that of realizability or possibility. Utopia itself is the reconciliation of these two elements:

> Erwartung, Hoffnung, Intention auf noch ungewordene Möglichkeit: das ist nicht nur ein Grundzug des menschlichen Bewußtseins, sondern, konkret berichtigt und erfaßt, eine Grundbestimmung innerhalb der objektiven Wirklichkeit insgesamt.[41]

The reconciliation or union, moreover, marks a new beginning (Genesis) that is not found at the beginning (Anfang), but at the end (am Ende) in the transcending medium of the Novum or Front, on the border to the future: "Bewußtsein der Front gibt dafür das beste Licht, utopische Funktion als begriffene Tätigkeit des Erwartungseffekts, der Hoffnungs-Ahnung hält die Allianz mit allem noch Morgendlichen in der Welt."[42]

In the second place, his broad typological study recognizes that this transcending or supra-historical utopian process of possibility and hope for a better future can be found in a variety of literary, artistic, and philosophical forms. These range from daydreams, to Märchen, to theatre, to music, and to religion. Hope, Bloch insists "... breitet sich aus in den ärztlichen und den sozialen, den technischen, architektonischen und geographischen Utopien, in den Wunschlandschaften der Malerei und Dichtung."[43] His typology also acknowledges that the pervading means employed to reach the desired goal defines the variety of utopia. The means can vary from technical innovation to social or political reorganization, by which is meant: "... die Grundrisse einer besseren Welt, was konkrete Technik angeht," as well as "..., was die Gesellschaft angeht."[44] Because he recognized both the social and technical "bases" of a better world, he was, thus, one of the first to realize that there were literary "technical utopias"[45] comparable in literary quality and historical and cultural significance to the social varieties.[46] He was also one of the first to express philosophically, the soul of technical utopianism, the hopes for a better world through the means of science. As Schwonke says of Bloch's work: "Die Hoffnung ... hat schon die ersten Verfasser von naturwissenschaftlich-technischen Utopien beseelt."[47]

Technical as well as social utopias can be further classified, according to Bloch, into a tradition of either order or freedom. He maintains, for instance, that Campanella[48] and Plato advocated order as a way to happiness: "und lange bevor die Freiheit ihren Staatsroman fand, hat Platons 'Politeia' Ordnung utopisiert."[49] Thomas More (Utopia), on the other hand, and also technical utopian thinkers, like Francis Bacon (New Atlantis) and "die bürgerlich-demokratische Zukunft, mit H. G. Wells als erstem Champion,"[50] are said to have offered the Freiheits-Ziel as the best future. Like Mannheim, he realized[51] that the nature of freedom can change according to the utopian thinker's socio-historical environment. Bloch, however, also contends that the individual can transcend his milieu to express a general notion of or desire for freedom in opposition to authority. This desire for freedom, moreover, like that for order, is revealed in the views espoused in the utopias. The appreciation for the science of alchemy, for example, exhibits a wish for freedom and change, while an emphasis on the science of astrology illustrates a desire for order:

"... Morus oder die Utopie der Freiheit entspricht fast so sehr der Alchemie, wie Campanella oder die Utopie der Ordnung eben der Astrologie entspricht."[52] Architecture, too, can mirror the hope for either order or freedom, and can thereby determine the variety of utopia. Campanella's astrologically-determined and centralized "city in the sun," consisting of Wohnblöcke and Hochbauten, reflects the wish for order, whereas More's society, in which architecture consists of individual houses or Flachbauten, portrays a liberal utopia seeking freedom.[53]

Thus, Bloch's model of utopian thought embraces two basic elements, the subjective idea of hope, which creates the intellectual continuity throughout all utopias, and objective possibility (Möglichkeit). Like Mannheim, he recognized the deterministic nature of utopian thought. Yet he placed less emphasis on its social nature in order to elaborate upon the transcending historical continuity amongst all utopias, regardless of their quality, variety, or social and historical origins. He also presented a typological study that is more complete than Mannheim's in that it recognizes as a technical utopian form, that literature, whether popular or didactic, that appreciates science as a means to happiness.

His model, nevertheless, clearly shows its two major problems. In the first place, it is deficient in content. Because the model's essential idea of utopian continuity is established mainly on the somewhat ideal notion of hope, it fails to stress other forces, indeed "modern" progressive and liberal forces, that are reflected in ancient and modern utopias. In the second place, perhaps because Bloch attempted to consider too much,[54] his examination of certain utopian thinkers and, consequently, his model-typology remain, at times, superficial and incomplete. His look at Plato, for instance, exemplifies this typological problem. He classified Plato's utopian works in one, the tradition of order and two, the socio-political tradition. He failed, however, to recognize that Plato's utopian works, although they do on occasion mirror a desire for order, also express views that represent the forces and tradition of change, mobility, and "freedom."[55] He also neglected to examine what could be called the "modern technical" utopian mentality of Plato. His analysis and, consequently, his classification of Plato's utopian outlook are, therefore, incomplete and inaccurate.

His typology, more specifically, his classification of particular works of literature is also confusing due to his inability to distinguish Märchen[56] from utopias. In A Philosophy of the Future, for example, he suggests that Francis Bacon's New Atlantis and Kurd Lasswitz's Auf Zwei Planeten (Two Planets) are fairy-tales or Märchen that "... also contain imaginative forecasts of some technical utopian objects--by no means only in a magical and hence impossible form."[57] In his earlier work, Das Prinzip Hoffnung, he claimed that the novel by Lasswitz is "märchenhaft--unwahrscheinlicher Ausdruck."[58] His attributing the qualities of "märchenlike" and "improbable" to the nature of Two Planets, opposed, however, his later suggestion that this work contains the "utopian" elements of hope and "possibility" for the future in its forecasts on new technical objects. This obvious contradiction can be resolved if one accepts Bloch's own demand that utopias be realizable. Unlike these, Märchen and fairy-tales are Irrealwünsche,[59] offering an es war einmal mentality rather than the requisite utopian "berechtigten Hoffnungen für die Zukunft." Therefore, Märchen and technical utopias are basically different in that "was heute Utopie ist, kann morgen Wirklichkeit sein."[60]

While it is true that *Irrealwünsche* or fantasy can be found in utopias, utopias cannot simply be classified also as *Märchen*. If Kurd Lasswitz's *Auf Zwei Planeten* is, as Bloch claimed, purely *Märchen*, then it should not have been considered in his study on utopian literature. If, on the other hand, it is a technical utopia with elements of fantasy, like Bacon's *New Atlantis*, then it should have been classified as such. It should also have been classified as a representative work in his own tradition of freedom, and as one expressing, no less than Bacon's pioneer technical utopia, the utopian notion that "in die Natur gesetzten Hoffnungsinhalten ausgezeichnet [sind]."[61] Moreover, while his typology recognizes science fiction as a "tepid extension"[62] of the utopian theme, it fails to acknowledge that representative works of a certain quality[63] may be historically and culturally significant as valid technical utopias, exhibiting the components of his own utopian model: hope and realizability.

In awareness, then, of the problems with the prototypes of these two men, it is necessary now to turn and, through elaboration, attempt to correct the deficiencies in their models and, thereby, create a technological utopian model.

PART II

The Technological Utopian Model

The utopian frames of reference designed by Bloch and Mannheim, while useful devices, are inadequate. What is required is a prototype that adds a new dimension to utopian thought, one that accentuates science and a scientific elite as means of creating a better future. What is needed, moreover, is a model that is flexible enough to apply to scientifically-orientated works ranging from Plato's Timaeus and Critius to modern German science fiction, and one that can be used to ascertain whether or not a philosophical or literary work containing scientific elements is indeed a technological utopia. The synthesis of such a model will be based on an elaboration and rectification of those created by Mannheim and Bloch.

Mannheim's assertion that existing ideological viewpoints are either espoused or opposed by the utopian elite is an important aspect of utopian thought for two reasons. First, it recognizes that utopias are determined by and develop from the existing reality. Contrary to Dahrendorf's claim that utopias "do not grow out of familiar reality following realistic patterns of development,"[64] Mannheim's model concedes that utopias are very much part of their temporal, spatial, and social origins. Second, the idea that certain social or political views are rejected in favour of others that transcend reality, as well as the fact that utopias are not realizable in the existing social situation,[65] insures that change and a desire for a better future are also facets of utopian thought. As Mannheim suggests, thought, especially utopian thought, "... is a particularly sensitive index of social and cultural change."[66]

Mannheim showed greater concern for the utopian thought of the political elite than for that of literary intellectuals. Yet popular or philosophical utopian literature, specifically that dealing with science and technology, can also express ideas that are shaped by the authors' time, place, and social or professional class.[67] Moreover, the novels or philosophical dialogues of this literary elite may function as an historically and culturally valuable "sensitive index" of appreciation for or discontent with the values and perspectives of the contemporary society. Furthermore, Mannheim's political elite offers either violent or passive parliamentary methods[68] to effect change and influence the populace. Literary means, although passive, can also affect the populace and offer, in his own utopian terms, "revolutionary possibilities" clearly not "'organically' and harmoniously integrated into the 'world-view' characteristic of the period."[69] As utopian literature, then, technologically-orientated works can, in a truly utopian manner, advocate social and scientific alternatives for the future that could affect the existing value structure and outlook, while as popular literature, they could influence the readers. It is, therefore, proposed that model technological utopian literature accepts some and rejects other socially-determined social, scientific, and political views and attitudes of contemporary society. In the rejection, moreover, progress is implied as new, indeed revolutionary alternatives for the future are posed to the reading public.

Mannheim's typology is also relevant to and of use in the creation of our technological utopian frame of reference. It is, however, confined in both time and quality. His liberal-humanitarian variety, for example, which advocates reason, justice, the well-being of man, social mobility, and peace,[70] begins only with the political utopianism of the eighteenth century. Yet the liberal-humanitarian idea can be augmented to include certain liberal views contained in the utopian mentality of Plato, as well as modern German science fiction. The liberal idea being considered here is not defined in the context of a political party or a concept of liberalism, but as a liberal-humanitarian frame of mind. It is realized that "as an attitude of mind, liberalism was as old as Greek philosophy, but as a state polity and as a form of social organization it was first clearly and boldly outlined in the eighteenth century."[71] What is contended here is that liberal notions, such as social mobility, feminism or respect for the rights and abilities of women, social reform, international peace,[72] as well as the encouragement of scientific inquiry and scientific application or technology for the benefit of man, are found in literature ranging from Plato's dialogues, the Timaeus and Critius, to modern German science fiction. It is thus proposed that a modern liberal-humanitarian or anti-dogmatic, anti-authoritarian tradition constitutes the second part of the technological utopian model.

Bloch emphasized the somewhat ideal force of hope rather than progress in his utopian model. While this author is aware that the origins of the idea of progress is a debatable issue,[73] it is nevertheless asserted that the modern desire for progress, notably material progress, change, improvement in life through social and technological means, and freedom are equally important forces in technological utopianism. Moreover, these modern forces are not limited, as Bloch maintained, to a comparatively recent tradition of modernization and liberalization from Thomas More to H. G. Wells, with H. G. Wells "an der Spitze."[74] On the contrary, his tradition of hope and freedom (Freiheit), and with this the "modern" tradition of desire for social and technological change, can be extended to include works ranging from the Timaeus and Critius by Plato, to select works of modern German science fiction. It is, therefore, suggested that both the tradition of hope and the desire for social, scientific, and material progress and freedom compose the third facet of the technological utopian model.

Related to these three essential parts, which determine the limits of the technological utopian model, are two salient model themes. Due to the "social nature of thought," images, attitudes, and biases on particular social and political topics can change in nature according to the temporal, spatial, and social circumstance of the author. Moreover, the means employed to reach the goal, whether social or scientific and technological, can vary in their degree of sophistication and become more realizable with time. Historical change, therefore, is one constant theme in the model. Professor Negley[75] claims that it would be a "challenge" to find historical continuities in utopian literature through the ages. Yet regardless of the social milieu, utopian writers do criticize and reject certain prevailing social, political, and scientific outlooks. Subsequently, they adopt others that conflict with those of the social matrix and are not at that time realizable. These adopted ideas belong to a transcending supra-historical outlook that expresses a modern mentality of liberal-humanitarianism, freedom, and social and scientific progress. The adoption and expression of this new outlook thereby creates the second theme of the model, that of intellectual continuity.

Technological utopianism has thus been defined in terms of a conceptual model* derived from the utopian ideas of Karl Mannheim, Ernst Bloch, and this author, composed of three parts, and presenting two themes in which views expressed function as indicators of, on the one level historical change, and on the other, intellectual continuity. This model, moreover, is flexible enough to encompass a mentality from

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*Refer to Table I, p. 182.

Plato to modern German science fiction, yet rigid enough to demand that certain component parts be present if a work is to be considered a technological utopia. Social criticism should be inherent in the work. This alone, however, is not enough. The basic element of futurism must also be in evidence,[76] as well as the stress on science and a scientific elite as means to reach the future goal, if the work is to satisfy the model's criteria. The model can, thereby, serve as a device to determine whether works of literature offering scientific considerations are genuine technological utopias of historical and cultural significance, or are just social literature, satire, or trite science fiction.

In awareness of the components and criteria of the model, it is necessary now to test and validate the model by applying it, in chapter two, to works by Plato, Valentin Andreae, and H. G. Wells that present scientific considerations. In so doing, the attempt will be made to demonstrate that these works satisfy the conditions of the model proposed and as such, can be considered philosophical technological utopias. In chapter three, the model will be applied to select works of German science fiction by Kurd Lasswitz, Otto Willi Gail, and Hans Dominik to demonstrate that these, too, fulfil the criteria of the model and can also be classified as technological utopias, although of a literary rather than philosophical variety.

FOOTNOTES

CHAPTER ONE

[1] Arthur Morgan, Nowhere was Somewhere. How History Makes Utopias and How Utopias Make History (Chapel Hill: University of North Carolina Press, 1946), p. 17.

[2] Georges Duveau, Sociologie de l'Utopie et Autres "Essais", intro. André Canivez, Bibliothèque de Sociologie Contemporaine (Paris: Presses Universitaires de France, 1961), passim; and Helmut Swoboda, Utopie. Geschichte der Sehnsucht nach einer besseren Welt (Wien: Europa Verlags-A.G., 1972), pp. 18, 29.

[3] International Encyclopedia of the Social Sciences, 1968 ed., s.v. "Karl Mannheim," by Edward Shils, pp. 151-52.

[4] Mannheim was not a Marxist. This has been concluded from a reading of his works and works about him and his writings. There is, however, a clear "social" element to his thinking, and it is his notions on the sociological nature of thought that are of concern and relevance to this study.

[5] From The Encyclopedia of Philosophy, 1967 ed., s.v. "Ernst Bloch," by Franco Lombardi, pp. 321-22; and Ernst Bloch, Das Prinzip Hoffnung, 3 vols. (Frankfurt-am-Main: Suhrkamp Verlag, 1959), 1: introduction, passim.

[6] Others who recognize the "need" for utopias include: Margaret Mead in "Towards More Vivid Utopias," in Utopia, ed. George Kateb (New York: Atherton Press, 1971); Frederik Polak in The Image of the Future, trans. and abridged by Elise Boulding, foreword by Kenneth Boulding (San Francisco: Jossey-Bass Inc., Publishers, 1973); and Paul Tillich in Politische Bedeutung der Utopie im Leben der Völker, intro. Otto Suhr (Berlin: Gebrüder WeiB Verlag, 1951).

[7] Karl Mannheim, Ideology and Utopia, foreword by Louis Wirth and Edward Shils, preface by Louis Wirth (London: Routledge and Kegan Paul, 1936; paperback ed., 1976), p. 202.

[8] Ibid., p. 236.

[9] Bloch, Prinzip Hoffnung, 1:11.

[10] Ibid., 2:550.

[11] Ernst Bloch, A Philosophy of the Future, trans. John Cumming (New York: Herder and Herder, An Azimuth Book, 1970), pp. 90-91.

[12] Bloch, Prinzip Hoffnung, 2:551, 556.

[13] Including Karl Mannheim's Man and Society in an Age of Reconstruction, trans. Edward Shils (London: Routledge and Kegan Paul, Ltd., 1948); Essays on Sociology and Social Psychology, ed. and intro. Paul Kecskemeti (London: Routledge and Kegan Paul Ltd., 1953); and Essays on the Sociology of Culture, intro. Ernest Manheim, and ed. Ernest Manheim and Paul Kecskemeti (London: Routledge and Kegan Paul, Ltd., 1956). These works deal with Mannheim's own methods, such as education and a return by modern society to Christianity, to reconstruct a new and integrated society.

[14] Mannheim, Ideology and Utopia. This particular edition consists of translations into English of his original article "Wissenssoziologie," which deals with his sociology of knowledge, and his Ideologie und Utopie, which is concerned with his views on the nature of utopian thought.

[15] Shils, "Karl Mannheim," p. 557; and Louis Wirth in his introduction to Mannheim's Ideology and Utopia, p. xxiv.

[16] Mannheim, Ideology and Utopia, p. 253.

[17] Ibid., p. 254.

[18] Ibid., p. 2.

[19] Ibid., p. 186.

[20] Ibid., p. 183.

[21] Gunter Remmling, The Sociology of Karl Mannheim. With a Bibliographical Guide to the Sociology of Knowledge, Ideological Analysis and Social Planning (London: Routledge and Kegan Paul, Ltd., 1975), p. 73.

[22] Mannheim, Ideology and Utopia, p. 174.

[23] Ibid., p. 104. For example, he sees utopian elements in Fascism.

[24] Ibid., pp. 190-222.

[25] Remmling, p. 92.

[26] Mannheim, Ideology and Utopia, p. 127.

[27] Shils, "Karl Mannheim," p. 557. Remmling (pp. 142-43) and E. Manheim, in his introduction to Essays on the Sociology of Culture, by Karl Mannheim (p. 6), maintain that Mannheim, in his later years, moved somewhat from a faith in pure determinism to an acceptance of the idea of historical continuity. Nevertheless, his utopian model still suffers from his earlier faith in thought being purely influenced by and only meaningful in its social environment.

[28] Mannheim's later works (see footnote 11), which deal with the problem of social planning, fail to consider in depth, if at all, the forces of science, technology, and communications as means that can either influence the mass, or create a new society through their application.

[29] Shils, "Karl Mannheim," p. 559.

[30] Ibid., p. 559.

[31] Judith Shklar, "The Political Theory of Utopia: From Melancholy to Nostalgia," in Utopias and Utopian Thought, ed. and intro. F. E. Manuel (Boston: Houghton Mifflin Co., 1966), p. 102.

[32] Bloch, Prinzip Hoffnung, 1:355.

[33] Lombardi agrees that Bloch's "major work, Das Prinzip Hoffnung, gives the impression that Bloch, although claiming that the economic element is fundamental (Marxist) relegates it to a secondary level and focuses his attention on what Marxist theory regards as only a superstructure, the problem of intellectual culture" (p. 322).

[34] Bloch, Prinzip Hoffnung, 1:9.

[35] Bloch also ascribes the terms desire, "Hunger" or "Appetitus," and longing or "Sehnsucht" to the notion of Hope. Bloch, Prinzip Hoffnung, 1:6, 71-84.

[36] Ibid., p. 5.

[37] Eric Hobsbawm, "Das Prinzip Hoffnung," in Materialien zu Ernst Blochs 'Prinzip Hoffnung', herausgegeben und eingeleitet von Burghart Schmidt (Frankfurt-am-Main: Suhrkamp Verlag, 1978), pp. 177-78.

[38] Bloch, Prinzip Hoffnung, 1:11.

[39] Bloch, A Philosophy, p. 144.

[40] Bloch, *Prinzip Hoffnung*, 1:203. Bloch recognizes a variety of "Möglichkeiten," of which "das objektiv-real Mögliche" is the "real" possibility contained in utopian thought (pp. 258-71). The fact that the "hope" is possible makes it a "begriffene Hoffnung" (p. 5).

[41] Ibid., p. 5.

[42] Ibid., p. 166. Reality, according to Bloch, transcends the present: "Wesen ist nicht Ge-wesenheit; konträr: das Wesen der Welt liegt selber an der Front" (p. 18).

[43] Ibid., p. 12.

[44] Ibid., 2:728-29, 817.

[45] In fact, in spite of his Marxist predilections, most students of Bloch's utopian thought point to his having looked favourably on what he called bourgeois, even capitalistic technical utopias. Hobsbawm, p. 181, Renate Damus in *Ernst Bloch. Hoffnung als Prinzip--Prinzip ohne Hoffnung* (Meisenheim-am-Glan: Verlag Anton Hain, 1971), p. 51-52, and Burghart Schmidt in "Ein Bericht: Zu Entstehung und Wirkungsgeschichte des "Prinzips Hoffnung"," Einleitung zu *Materialien zu Ernst Blochs 'Prinzip Hoffnung'*, pp. 16, 34, concur that, while he opposed the mechanical rationalism and other aspects of scientific methodology, he appreciated those technical utopian dreams of a better life through science. (What Bloch described as a technical utopia, shall be called a technological utopia in this study).

[46] As Bloch states: "es gibt technische Wunschbilder so gut wie soziale, sie stehen an Kühnheit hinter diesen nicht zurück, waren, als Zurückdrängung der Naturschranke, ja als Bildung einer Welt für uns, stets mit ihnen verschlungen. Und jedes Kunstwerk, jede zentrale Philosophie hatte und hat ein utopisches Fenster, worin eine Landschaft liegt, die sich erst bildet (*Prinzip Hoffnung*, 2:727-28).

[47] Martin Schwonke, "Das Wünschen," in *Materialien zu Ernst Blochs 'Prinzip Hoffnung'*, p. 86. Bloch also recognizes mythological themes in technical utopias and unlike Mannheim, acknowledges the "positive" function played by this mythological element. Indeed, the "Promethean Spirit," the desire to overcome the powers of nature, plays an important role: "... es ist die technisch intendierte 'Übernaturierung' der Natur selber, welche Einwohnerschaft in der Natur verlangt" (*Prinzip Hoffnung*, 2:784). Mannheim, on the other hand, emphasizes that myths, as pseudo-history or fictions, can function negatively in both ideologies and utopias to hide reality or the truth (*Ideology and Utopia*, pp. 175-76, 184). While Bloch does recognize this negative function in utopian thought, he stresses the positive purpose of myths and fictions in technical utopias. David Kadinsky in *Der Mythos der Maschine. Aus der Praxis Analytischen Psychotherapie*, mit einem Beitrag von Margot Kadinsky (Bern: Hans Huber Verlag, 1969),

also recognizes the positive function played by mythological notions in utopias. He claims that man's attempts to overcome the forces of nature through applied science or technology and the symbolic "machine" have played a decisive role in man's psyche from the Greek myth of *Daedalus* (pp. 32-34), to biblical chariot sagas (p. 32), to modern dreams and phobias (p. 216).

[48] Campanella, according to Bloch, advocated order as a means to and a goal of a better life: "nicht durch Freiheit, sondern durch eine bis ins Einzelnste vorgesehene Ordnung kommt das Glück aller hier ins Lot" (*Prinzip Hoffnung*, 2:551).

[49] Ibid., p. 566.

[50] Ibid., pp. 551-53, 614-15, 682, 720.

[51] Ibid., p. 615.

[52] Ibid., p. 613.

[53] Ibid., pp. 866-68.

[54] His major work on utopian thought, *Prinzip Hoffnung*, is encyclopaedic. It consists of three lengthy volumes, which place under one utopian roof works ranging from the theological to the musical.

[55] Plato's position and scientific utopian works will be analysed in chapter two. Bloch's classification and analysis of Plato's scientific works, as well as his views on those by Valentin Andreae and H. G. Wells, will also be considered in chapter two.

[56] Bloch, *A Philosophy*, pp. 87-88. Throughout this thesis, we shall use the term *Märchen* (*Kunstmärchen*) to denote that level or quality of fairy-tale or legend that, unlike simple stories (*Volksmärchen* and children's fairy-tales) and like allegorical tales, also offers some deeper meaning or social critique.

[57] Ibid., p. 88.

[58] Bloch, *Prinzip Hoffnung*, 2:734.

[59] Schwonke, "Das Wünschen," p. 86.

[60] Ibid., p. 86.

[61] Bloch, *Prinzip Hoffnung*, 1:13-14; 2:553, 758 ff. In opposition to Bloch, this author contends that Kurd Lasswitz's

Two Planets, while it certainly contains elements of fantasy, is, nevertheless, a valid technological utopia. This contention will be elaborated upon in chapter three.

[62] Bloch, A Philosophy, p. 88.

[63] This author argues, for instance, that Kurd Lasswitz's Two Planets is science fiction. Indeed, it represents science fiction of such a high calibre that it qualifies to be classified as a technological utopia, and one, moreover, that expresses social criticism as well as the hope for social and technological change and freedom, in the technological utopian tradition of Plato, Francis Bacon, and H. G. Wells. This science fiction work, along with others by Lasswitz, Otto Willi Gail, and Hans Dominik, will be looked at in chapter three.

[64] Ralf Dahrendorf, "Out of Utopia: Toward a Reorientation of Sociological Analysis," in Utopia, p. 104.

[65] Mannheim, Ideology and Utopia, p. 177.

[66] Ibid., p. 74.

[67] Ernst Bramstedt, Aristocracy and the Middle Classes in Germany. Social Types in German Literature, 1830-1900, foreword by G. P. Gooch (Chicago: The University of Chicago Press, 1964; Phoenix Books, 1964). Recognizing that "writers, consciously or unconsciously, reflect and illustrate trends and attitudes of the society in which they live" (p. xv), Bramstedt applies Mannheim's sociology of knowledge to select works of nineteenth century German literature. While his concern is with social types and the values they espouse, as reflected in purely social literature or social novels, our concern here is to analyse, in terms of Mannheim's sociology of knowledge and utopian model, the values and attitudes manifested in modern German science fiction literature.

[68] Mannheim, Ideology and Utopia, p. 127.

[69] Ibid., p. 174.

[70] Ibid., pp. 133, 149, 206.

[71] J. Salwyn Schapiro, Condorcet and the Rise of Liberalism (New York: Harcourt, Brace and Co., Inc., 1934), p. 3.

[72] Ibid., p. 3, passim.

[73] Schapiro (p. 234), Edgar Zilsel, "The Genesis of the Concept of Scientific Progress," *The Journal of the History of Ideas* 6, no. 1 (1945): 325-49, and J. B. Bury, *The Idea of Progress. An Inquiry into its Origins and Growth* (London: MacMillan and Co., Ltd., 1920), p. 65, maintain that the idea of progress is a post-sixteenth century or modern concept, while Karl Löwith in *Meaning in History. The Theological Implications of the Philosophy of History* (Chicago: The University of Chicago Press, 1949), pp. 2, 6-10, 182, and Jules Delvaille in *Essai sur L'Histoire de l'Idée de Progrès jusqu'à la Fin du XVIII^{e} Siècle* (Génève: Slatkine Reprints, 1969), pp. 3-4, 10, 18-19, 29, 74-75, 92, claim that the idea of and the desire for spiritual and material progress and social change have been alive since biblical and ancient times.

[74] Bloch, *Prinzip Hoffnung*, 2:720.

[75] Glenn Negley, Comp., introduction to *Utopian Literature. A Bibliography with a Supplementary Listing of Works Influential in Utopian Thought* (Lawrence, Kansas: The Regents Press of Kansas, 1977), p. xiv.

[76] This, thereby, excludes purely social literature like works by Charles Dickens, Emile Zola, or Theodor Fontane, as well as German *Märchen*.

CHAPTER TWO

TECHNOLOGICAL UTOPIANISM:

The European Philosophical Tradition

Science and technology have always played a significant social role. The value of this role however has, on occasion, been questioned, especially in works of literature. At times, this literature has satirized the faith in science (Gulliver's Travels), or overestimated its value (the Realist tradition), or condemned its overpowering intrusion into man's spiritual and artistic life (the Romantic tradition). Regardless of his opinion of the social worth of science, man has always been aware of and awed by its potential and power. Nowhere is this respect more evident than in that literature that looks upon science and technology as means (if used wisely and in moderation) of improving life for mankind. Of particular concern to us here are those utopian works that offer scientific content, and that can, it is proposed, be distinctly defined as technological utopias of a philosophical variety.[1] Before applying the model, already devised, to representative scientific utopias by Plato, Valentin Andreae, and H. G. Wells, it is necessary to examine both the background, and the rationale involved in the selection, of the authors and their literature.

PART I

THE AUTHORS: Their Lives and Works

Many authors have considered, in utopian form, the value and potential of science and technology. This chapter, however, will concentrate on Plato, Valentin Andreae, and H. G. Wells for four main reasons. All were seriously interested in the sciences and the scientific developments of their time. This was an essential consideration. A second factor that determined their selection was the date of their writing. In an effort to demonstrate an early to modern technological utopian tradition that exhibits common themes and outlooks, it seemed logical to choose Plato, as an ancient Greek, and Wells, as a modern Englishman, for study. In order to represent the specific German tradition, the seventeenth century German utopist, Andreae, was chosen.

Another factor in the selection process was the quality of their social and professional backgrounds. Plato's background, as an ancient Athenian aristocrat and teacher, played an important part in shaping his views about the scientific community and the political elite, on science, and on politics. Andreae's position, as a seventeenth century German Lutheran minister, also played a significant role in moulding his outlook regarding these same topics. Due to the influences of his "sociology of knowledge," his outlook contrasted in many ways with that of his utopian predecessor, to present the theme of change according to time, place, and social circumstance. Wells presented views on the relevant topics that were conditioned by his nineteenth English environment. His practical, scientific, and business-like mentality clearly distinquished his views from those of his more philosophically (Plato) and religiously inclined (Andreae) predecessors. As a result, his views also demonstrated the theme of change, and so he too became a valuable choice for study. The final selection criterion was the quality of the literature. All offer philosophical treatises or dialogues, rather than novels. This being true, their works can be considered to belong to the European "philosophical" rather than "literary" tradition. Even Wells expressed in a philosophical manner, many of the modern views and images found in twentieth century German "literary" science fiction. These centred on the particular topics of (1) women, (2) the scientific and political elites, (3) science, and (4) politics.

Plato (ca. 428-348 B.C.) represented the aristocratic establishment of ancient Greece. Opposed to the political victory of the democratic "Group of Thirty" in Athens in 404 B.C., he dissociated himself from active political life, adopting instead the teaching profession, and taking up writing as a means of voicing his social and political observations and criticisms.[2] His broad range of thought encompassed views on law, higher education, ethics, justice, personal morality, politics, and sociology. We are concerned, however, with those ideas on science and technology set forth in his scientific literature, the Republic, the Timaeus, and the Critius.[3] While the Timeaus served a religious function, dealing with the religious and physical origins of the cosmic system,[4] and although the Critius is a story based on mythology and one describing an Athens long before Plato's time, both works are significant here for they present his positive and negative views on the four topics under consideration. The Critius, especially, conveys his views on science and technological change. Many, including Desmond Lee, Alice Gaar, and Ernst Bloch,[5] look upon the Critius as one of the first science fiction tales. Indeed, Bloch regards it as a technische Utopie. The Republic too is valuable because it presents Plato's views on the pertinent topics, including science, and because it is clearly part of his scientific utopian trilogy (which includes the Timaeus and Critius).

A contentious issue exists amongst some scholars as to whether or not the Timaeus, the Critius, and the Republic are related. F. M. Cornford claims that the Timaeus, representing merely a "myth of creation" preface to the Critius, is in no way connected to the Republic. He insists that the citizens of proto-historic Athens should not be identified with those of republican Athens for: "the design of the present trilogy (Timaeus, Critius and Hermocrates) is ... completely independent of the Republic." A. E. Taylor, on the other hand, suggests that both the Timaeus and the Critius are a continuation of, and an elaboration on Plato's utopian ideas outlined earlier in the Republic, and thus all three works contribute to his utopian frame of mind. Specifically, he contends that, while the Republic was written prior to both the Timaeus and Critius, the flow of ideas suggest that their order should be the Timaeus, which lays the cosmological foundations for both the Republic and the Critius, then the Republic, and finally the Critius, which offers the history of the Republic.[6] It is clear, moreover, from the introduction of the Timaeus that Plato wished to relate the works in order to create a trilogy. The introductory conversation amongst Critius, Timaeus, and Socrates unites the society of proto-historic Athens with the socio-political ideas and citizenry of the new Athens. As Critius says: "we will transfer the imaginary citizens and city which you described yesterday /in the Republic/ to the real world, and say that your city is the city of my story and your citizens those historical ancestors of ours whom the priest described."[7] All three works, therefore, must be considered in order to gain a complete picture of his technological utopian outlook.

Johann Valentin Andreae (1586-1654) was born in Swabia, Germany, and attended the University at Tübingen before becoming a Lutheran minister.[8] While a number of his works are pertinent to his utopian thought, the most famous is Christianopolis. This "scientific-technical utopia"[9] deals not only with his views on education, but more importantly, with his progressive and regressive views on the topics under consideration in this study. H. G. Wells (1866-1946) was educated in the general sciences (biology, zoology, and physics) while studying, under T. H. Huxley and at the Royal College of Sciences, to become a teacher.[10] As a vehicle to express his social, political, and scientific ideas, he turned to the profession of writing popular literature. A prolific writer, he wrote a number of literary and scholarly works.[11] Our interests, however, lie with his philosophical scientific works, notably Anticipations and its sequel A Modern Utopia,[12] which reveal his positive and negative views on the relevant four topics. Bloch considered Wells a "champion" representative of "technical utopianism."[13] Although this is a correct assessment, it is one based solely on a study of his The War of the Worlds and The Time Machine. Bloch, neglectfully, failed to examine Wells's A Modern Utopia and Anticipations; yet these are his major utopian works, and the two essential contributions that add to one's understanding of his technological utopian frame of mind.

The study, then, will concentrate on select scientific works by Plato, Valentin Andreae, and H. G. Wells. Although it is beyond the scope of this paper to examine in depth works by Roger Bacon (mediaeval period, 1214-1292), Francis Bacon (early modern period, 1561-1626), and Condorcet (modern period, 1743-1794), their relevant works[14] and views will be referred to on appropriate occasions to support a claim, and lend greater credence to the argument concerning the existence of a technological utopian tradition.

Now that we have examined the authors, we must turn and apply the model to their literature. In so doing, we intend to demonstrate "how" and "why" some views on the four specific topics differ with time (historical change), while others reveal a common desire (intellectual continuity) for (1) social mobility, (2) liberal-humanitarianism (Mannheim), (3) social and scientific freedoms (Bloch), (4) social and scientific progress, and (5) peace and hope for the future.

PART II

WOMEN

The Theme of Change

The position of women in Plato's society was acceptable in the diversity and demanding nature of job opportunities offered to them. In addition to their duties as wives, for example, to the Guardians, and as "breeders" of children to be held in common by this Guardian class,[15] women could function in intellectually and physically demanding roles as decision-making Guardians or in the military. In the *Timaeus*, for instance, Plato refers to the "men and women in authority," while in the *Republic*, in reference to marriage, he recommends that "such women ... must be chosen for such men, to live with them and guard with them, since they are fit for it and akin to them by nature,"[16] The *Critius*, moreover, in describing the social and military structure of proto-historic Athens, makes mention that "men and women ... both took part in military exercises."[17] Quite different was Andreae's view, which reflects the influence of his German Protestant background. The status of women in his utopia was considerably lower than in Plato's in that here they were denied rights in political decision-making. Emphatically, Andreae insists that "in the Church and in the council hall they [women] have no voice ...,"[18] for married "women's work" concerns instead mainly patching, sewing, "the care of the house and the kitchen," and the raising of children.[19] In addition, however, to these intellectually unrewarding pursuits, he offered women the opportunity to function outside the home, in teaching careers. A relatively progressive, liberal mind, comparable to that of Francis Bacon, manifests itself in the fact that in Christianopolis, "the married women make use of the knowledge which they have acquired in College .... Whatever scholarship they have, being mentally gifted, they improve diligently, not only to know something themselves, but that they may sometimes also teach."[20]

Andreae limited women to two alternative social positions, teaching and motherhood. Wells mirrored the influences of his modern liberal-minded environment, as well as the feminist movements in Britain at the time, as he presented women with comparatively more numerous and complex career opportunities. Like Plato, he accorded women the right to function in the decision-making process, allowing qualified university educated women to volunteer as "Samurai," and thereby to help govern the World Republic. He specifically states that "any intelligent adult in a reasonably healthy and efficient state, may at any age after five and twenty, become one of the Samurai, and take a hand in the universal control."[21] Opportunities in trade, clerical work, business-management, and professions such as medicine and science were also open to women. Home-making and child-rearing, moreover, were recognized as legitimate forms of employment. In A Modern Utopia, they are elevated to classification as civil service jobs, whereby a mother and her children can benefit from a State-awarded salary, to ensure their independence from the husband.[22]

On the one hand, then, these representative authors offered women a diversity of intellectually demanding alternative roles to that of "homemaker," the quality and number of which varied in accordance with the author's time and circumstance. On the other hand, however, and underlying these apparently progressive views regarding woman's role, was portrayed a negative image of women as basically inferior by nature.[23] This image, furthermore, justified various forms of discrimination, whether sexual or economic exploitation, or patronage, depending on the author's social milieu. Plato exhibited the negative influences of his aristocratic-military perspective, when he upheld the view of woman as a mere sex-object or "breeder." In the Republic, for instance, female Guardians are subject to sexual exploitation by male Guardians: "The city which is to be arranged in the best possible way must have women in common ...." In war-time, moreover, any woman can be sexually abused by soldiers for "when young men prove themselves good and true in war ..., honours must be given them, and prizes, and particularly more generous freedom of intercourse with women."[24]

Andreae, as a Christian, did not advocate the common possession of women. Nonetheless, a bourgeois Lutheran form of discrimination shows itself in Christianopolis as wives of the elite are patronized for their Christian virtues of conscience, understanding, and moderation. As well, a negative Kinder, Küche, Kirche mentality is revealed by the fact the women of Christianopolis, regardless of their contributions in the teaching profession, are considered best suited by nature to function in the home as the "child-like" auxiliary to the husband, and as the mother. Andreae praises the wife of the judge for guarding her home and keeping silent under the direction of her husband, and firmly believes that the "crowning accomplishment of women is bearing children."[25] In contrast, Wells emphasized modern, economic forms of discrimination. Beyond the negative image of "breeder," or content and functionally restricted homemaker and teacher, his career woman was viewed as a professional competitor. To abate such competition, A Modern Utopia advocates economic discrimination, or less pay for equal work on the basis of woman's putative weaker nature: "her incapacity for great stresses of exertion ... her weaker initiative, her inferior invention and resourcefulness, her relative incapacity for organization and combination ...." To avoid aggressive feminine competition altogether, Wells offers an incentive to women to remain in the home. Like Andreae and the relatively modern utopist, Condorcet, Wells insists[26] that women are best fitted to the home. Taking this view one step further, however, Wells claims that payment to women by the State for rearing their children is "the only possible way" to equalize things between the sexes. Regretfully, the modern utopia's insistence "that motherhood is a service to the state and a legitimate claim to a living," while, on the one hand, a positive example of social and financial elevation, also represents a new form of discrimination, a modern way of encouraging women to remain in the home.

The Theme of Continuity

The three authors consistently revealed a dichotomy between mildly negative attitudes towards woman, which, as we have been, manifested themselves in various forms of discrimination, and positive ideal views of her nature. The latter avoided, indeed rejected and transcended contemporary harsh images of women, and, ideally at least, appreciated women's intellect and talents. This common and genuine appreciation for women was demonstrated by the fact that all three authors offered women job opportunities outside the home, whereby they could make use of their education. Plato argues that "if we are to use women for the same things as men, we must teach them the same things." In order to use this education, Plato offers women, regardless of class, lateral and vertical mobility to become, if qualified, a Guardian, a member of the military establishment, or by implication, a tradeswoman or shopkeeper: "we shall believe that our Guardians and their wives should practice the same things" for "... no practice or calling in the life of the city belongs to a woman as woman, or to a man as man, but the various natures are dispersed among both sexes alike, by nature the woman has a share in all practices ...."[27]

Andreae, in the liberal tradition of Plato and Francis Bacon, offers equal educational opportunities to women: "all the children of citizens in general, children of both sexes, are taken into training," and enables them to use this education in the profession of teaching.[28] Wells, too, grants women freedom and opportunities in basic and university levels of education. In addition, he demands "spiritual" equality for women: "for all purposes of the individual, women are to be as free as men" and "the ideal of virtual equality, the equality of spirit between men and women," shall exist in utopia.[29] Like his earlier predecessors and the relatively modern utopist, Condorcet, Wells also offers[30] women occasions to use their education and talents in activities outside the home. Career-orientated women, who remain single because of "emotional fastidiousness, intellectual egotism, or an honest lack of passion ...," can freely function in the public sector, as decision-makers in the World Republic, or in the private sector, as business managers, school mistresses, doctors, or researchers and scientists.

ELITES

The Theme of Change

In Plato's utopia, members of the scientific community were highly regarded, yet nevertheless relegated to membership in the third, or non-ruling, class of the Platonic social hierarchy. The influence of his own aristocratic background, his academic predilections, and perhaps even the existing military rule of Sparta[31] is clearly evident in the true heroes of his utopia. In the Republic, the unquestioned leaders of society are "philosopher-kings," in proto-historic Athens, a military elite "acted as guardians of their own citizens and ... [were] recognized as leaders of the rest of Greece," while in Atlantis, so Plato tells us, "ten absolute kings" maintained the social order.[32] In Andreae's utopian vision, as in that of Francis Bacon, the scientific community occupied a comparatively higher position in the utopian social hierarchy. Christianopolis clearly mirrors his appreciation for the accomplishments of scientists in the seventeenth century, as the representative of the scientific community, Abida, is placed in an esteemed third position in the ruling triumvirate. He is surpassed only by a judge, Abieser, and the supreme leader, a theocrat named Abialdron, whose moral qualities reflect Andreae's own background as a Swabian minister.[33] In contrast to Andreae's theocracy, religious leaders were not the heroes in the society envisioned by Wells. Instead, the influence of his own scientific background, as well as of the late nineteenth century appreciation for the "new scientifically-minded men," manifests itself in his voluntary ruling clique. The utopian "Samurai" include highly educated, multi-national scientists and technocrats, who share their supreme political decision-making status in the World Republic with other or political and business professionals. According to Wells, only a society whose "nobility" consists "of engineering, managing men, scientifically trained and having common ideals and interests, is likely to segregate and disentangle itself from our present confusion of aimless ill-directed lives."[34]

In addition to this improvement in their social status, the literature revealed an (1) increase in the diversity of scientific and engineering types, a progressive clarification and sophistication of their (2) form (professional classification), and (3) function (professional qualifications), as well as a progressive development in the social importance of their (4) content (personal qualities). These changes, moreover, again corresponded to the authors' social milieu.

In Plato's works, the scientists and engineers were comparatively few in number. Furthermore, their professional classification (or type) and qualifications were either ill-defined or not specified at all. The Guardians, we know, are academic-types, whose education in philosophy, mathematics, logic, justice (law), and politics, qualifies them to function as leaders. Although the physicians mentioned in the Republic, and the astronomers described in the Timaeus and the Critius are quite clearly defined scientific types, the Critius also discusses the building of temples and palaces, the mining and exploitation of natural mineral resources, and progress in agriculture.[35] These activities imply the presence of, what one could define professionally as, civil or construction engineers, metallurgists or mining engineers, and agriculturalists. However, the educational background of these ostensible and numerically limited engineering and scientific "types" is not made clear. In consequence, their professional competence remains obscured. Andreae, on the other hand, demonstrated a more modern awareness both of the diversity and complexity of scientific and engineering endeavours, and of the need to encourage scientific training, diversification, and "specialization," if society was to progress scientifically and technologically. His awareness is made clear in the numerous, specifically named and, thereby, clearly distinguishable scientific types of Christianopolis,[36] whose general characteristics anticipate modern-day scientific "specialists." It is also made manifest in his elaboration on and clarification of the professional and technical capabilities of his scientific and engineering specialists. In contrast to Plato, Andreae informs us that his scientists and technicians, like other members of the society, including the religious and legal administrators, are well-educated in grammar and religion, as well as mathematics and the natural sciences. He, thereby, at least attempts to clarify their level of scientific and technical expertise.

Like Andreae and Francis Bacon, Wells also recognized a number of distinct scientific and engineering specialists (types). Indeed, he insists that the nation that "produces in the near future the largest proportional development of educated and intelligent engineers, and agriculturalists, of doctors ... and intellectually active people of all sorts ... will certainly be the ascendent or dominant nation before the year 2000."[37] The professional calibre (or level of education) and the level of administrative activity of the members of Wells's scientific community, however, more than their diversity, distinguish them from those scientists described by his utopian predecessors. In contrast to those comparatively simple scientists described in Plato's or Andreae's utopia, the scientists of his new world are pictured, professionally, as highly sophisticated. They are shown to be capable, by training, in scientific areas of endeavour, as well as deemed competent in management and political decision-making, as organizers and directors of the World Federation. Functionally, moreover, these technocrats are not regionally restricted scientific-administrators, associated merely with a local triumvirate or House of Salomon. Instead, and like those presented in Condorcet's Fragment on the New Atlantis, they operate administratively and scientifically at the world level, in a "world-wide House of Salomon."[38]

The diversity, professional classification (form), and professional qualifications (level of function) of the scientists portrayed in the literature changed with time. The social importance of the personal qualities and moral character (content) of the scientific and engineering community also varied in a manner dictated by the author's social milieu. The scientists and engineers in Plato's utopian vision, while not portrayed as villainous, do not represent the heroes setting society's moral tone or patterning its standards of proper social behaviour. Like other members of society, the scientist is subject to the moral and social standards set by Guardians who "must be philosophers" and who "must become kings in our cities."[39] Andreae's engineers and scientists, although highly respected, still do not determine, with their own scientific values, the standards of social or moral excellence. In his Christian theocracy, as in that of Francis Bacon,[40] morality and virtue are defined in Christian terms, by a theocrat. Only in the modern utopias of Wells (and Condorcet), do the moral outlook and professional values of the scientific community become socially influential, indeed pervade the social fabric. No longer subject to philosopher-kings or theologians, men of science, sharing their heroic position with business-managers and men of politics, set the moral tone of society. In Saint-Simonian terms, technocrats and "captains of industry" now determine and model the morality and virtues of the new technocracy.

The Theme of Continuity

It is evident that all these authors, as is to be expected in true technological utopias, highly regarded the scientist and engineer, and their technological accomplishments. The utopian visionaries opposed, however, any anti-social abuse of technology. They clearly trusted the scientific community to behave in a scientifically, morally, and socially responsible manner, sharing its scientific and engineering achievements with "all" classes of people, not just the elite. Plato, for instance, clearly rejects any form of elitist irresponsibility or tyranny.[41] As the Guardians or political elite must rule justly, for "justice is useful even in peace" and "it is not the work of the just man to injure ... whether to injure a friend or anyone else," the physicians of the Republic must serve the health requirements of all citizens. Plato tells us, moreover, that the civil engineers of Atlantis, while obliged to construct defensive military fortifications and palaces for the Atlantean kings, also used their knowledge to provide technological conveniences that served the public needs, including harbours, docks, bridges across the circular canals, irrigation systems, as well as "covered hot baths for winter use" in which "separate accommodation was provided for royalty and for commoners ...." Mining engineers, furthermore, explored and exploited the natural mineral resources of Atlantis "from which were mined both solid materials and metals ...,"[42] to serve the needs of all the people.

In like fashion, Andreae demands that his religious and scientific ruling classes offer just and moral leadership, practice the virtuous and austere way of life that they preached, institute a form of social welfare, and provide all citizens with protection. The leaders of Christianopolis clearly satisfy these demands, as they ensure the availability of proper nursing care for the aged and as they prevent the exploitation of workers or artisans. The activities of other, or non-ruling, members of the scientific community also make clear Andreae's desires for a sense of social and scientific responsibility. Scientific educators furnish all citizens with scientific truth and knowledge. Doctors minister to their health needs. Agriculturalists and horticulturalists use their knowledge to improve food and livestock production, for the benefit of all citizens, while engineers provide housing and public buildings, some of which are fire-proof, as well as water and sewage systems, to improve the life of all Christianopolitans.[43]
Wells follows in this socially-orientated, humanitarian tradition. His utopia, too, insists that the political elite provides social assistance in the form of quality housing, pensions, and health insurance, and also allows the formation of trade unions to protect the "unorganized myriads." The scientific elite is also expected to be actively "engaged

more or less consciously in applying the growing body of scientific knowledge to the general needs ...."[44] Such technological achievements as the invention of automobiles, trains, and omnibuses are clearly intended to serve the public needs, not just those of a select few, while medical research is supposed to provide a better life for all in his utopia.

SCIENCE

The Theme of Change

These three authors expressed varying degrees of appreciation for the empirical and deductive epistemological methods. Nevertheless, all recognized science and technology as means to solve particular technical and social problems and, thereby, create a better society. By looking at their solutions to (1) technical problems in transportation (travel), as well as their answers to (2) social problems of (a) maintaining ample food supplies (agriculture), and (b) supplying adequate living space and making efficient use of the land (modifications of the land), one can see changes, subject to the author's circumstance, in the quality or complexity and extent of these solutions.

Plato, owing, in part, to the influences of the social and intellectual climate in ancient Athens, insisted that the experimental method is a less reliable epistemological method than pure reasoning. In the Timaeus, he clearly states that "one is apprehensible by intelligence with the aid of reasoning, being eternally the same, the other is the object of opinion or irrational sensation, coming to be and ceasing to be, but never fully real."[45] His primitive studies on the human frame, for example, attest to his ignorance regarding, and probable lack of desire for, experimental knowledge in anatomy.

In spite of this definite epistemological bias, Plato did reveal an appreciation for innovations in modes of transportation, developments in agriculture, and for transformations of the land to facilitate spatial or living problems with regard to a human population. In the Critius, travel, especially by sea, is shown to have been important to the island of Atlantis: "because of the extent of their power they received many imports." Consequently, to maintain shipping contacts with other lands, and also facilitate travel over the rings of water within the island itself, his innovative Atlanteans "proceeded to build ... harbours and docks ...," as well as canals and bridges. With regard to agriculture, the Critius makes manifest Plato's awareness of the need to cultivate natural resources and make progress in food production methods, if self-sufficiency is to be maintained, and, ultimately, the social problem of hunger alleviated and moderate luxury ensured. Here he tells us that, while Atlantis did import many commodities, "for most of their needs the island itself provided." Necessity dictated continued progress in food cultivation, so farming entailed exploitation and cultivation of both plants and animals. Animals were domesticated and "there were cultivated crops, cereals which provide our staple diet, and ... the fruits of trees ... providing the drink and food and oil ...--all these were produced by that sacred island, then still beneath the sun, in wonderful quality and profusion." The Critius also makes clear Plato's recognition of the value in modifying the land itself to provide, for example, water and living space for the population, and in order to construct well-planned cities. Indeed, Plato favourably describes the ingenuity of the inhabitants of Atlantis, how they channelled river water to provide irrigation for the people and the land, while: "over a long period of time the work of a number of kings had effected certain modifications in the natural feature of the plain. It was naturally a long, regular rectangle; and any defects in its shape were corrected by means of a ditch dug round it."[46] Once the Atlanteans had transformed the land to suit their spatial and living purposes, the city itself, which apparently reflects Mediterranean and astrological[47] influences, was designed and built. Indeed, it was efficiently designed to provide the citizens with "two-springs, cold and hot ... and ... covered hot baths for winter use," which included separate accommodation "for royalty and for commoners, and, again, for women, for horses, and for other beasts of burden, appropriately equipped in each case."[48]

Andreae and his contemporary, Francis Bacon, appreciated the seventeenth century excitement over the new learning of Galileo, Kepler, and Harvey. As a result, they surpassed the epistemological outlook of Plato, to look upon both the deductive method and the experimental or "practical sciences" as possessing equal merit. The laboratories in Christianopolis, for example, are dedicated "to chemical science [alchemy] and fitted out with the most ingenious ovens and with contrivances for uniting and dissolving substances."[49]

Andreae and Francis Bacon also revealed a more acute awareness of the potential of technology, and of the social benefits to accrue from progress in modes of transport, in agricultural techniques, and in ways to make efficient use of the land and accommodate populations. Consequently, the quality of their speculative solutions to these problems was comparatively more complex. Bacon, for instance, surpasses Plato's speculations on improvements in docks and harbours —

to facilitate mere water travel, as he envisages the creation of flying machines and underwater boats to solve the even greater problem of air and underwater transport: the Bensalemites "imitate also flights of birds: we have some degrees of flying in the air. We have ships and boats for going under water and brooking of seas ...."[50] Andreae, moreover, goes beyond Plato's vague considerations on agricultural developments and productivity, to demonstrate the need for a high level of agricultural "organization" to ensure relief from the sociological problem of hunger. To maintain adequate food supplies, horticulture and animal husbandry, as well as crop research, are deemed important economic and social areas of research and development in Christianopolis. So important is this sector of society that it is organized into one distinct government "department," managed by an expert in "agriculture, soil fertility, and breeding and care of animals ...."[51]

He also exhibits a more modern, businesslike awareness of the necessity to use land efficiently, and also plan cities and industries wisely. Metallurgy and minerology had been important and relatively progressive areas of research and development in Atlantis. In contrast, however, the industry in Christianopolis anticipates modern day industrial development[52] in its being situated near the appropriate raw material to save time and space, and thereby ensure efficient production. His city-plan, moreover, unlike Plato's conception of Atlantis, offers more than just an architecturally well-organized solution to the social problem of accommodating people. In addition to a set "form," which provides conveniently located public buildings, adequate housing, and proper sanitation or sewage systems for the citizens, the "content" or quality of his solution to the problem of accommodation anticipates modern construction safety standards. For example, the buildings and houses in Christianopolis are constructed of stone to ensure that they are fire-proof.

In the tradition of his utopian predecessors, Andreae, Francis Bacon (and Condorcet), Wells valued both epistemological methods of induction and deduction.[53] However, the quality of his speculations on new technological solutions to problems in transportation, agriculture, and land-use far exceeded in complexity and extent that of his predecessors. His novel ideas on new modes of travel, for instance, clearly surpass those of his predecessors as they mirror the nineteenth century influences on and the modern sophistication of his scientific thought. Beyond those earlier speculations on "mere" undersea, land, and even air travel, Wells focuses on the mathematical possibility of travel through the dimension of time.[54] As well, he elaborates in qualitative detail on the development of underground railways and omnibuses to solve anticipated problems in mass transit, and looks at transport trucks as a means to facilitate the movement of commercial goods.[55] His ideas on husbandry also go further than those of either Plato or Andreae. The latter restricted their considerations on husbandry to animal domestication, and looked upon it as a rational means to produce only the "best" livestock. Wells, on the other hand, takes the idea of controlled breeding methods one step further--to include mankind. Indeed, he hints at the notion of social and genetic engineering when he speculates on the potential of technology to control the quality of human populations. He also clearly reveals the influence of Social Darwinism on his thought, as well as his appreciation for Dalton's eugenic theories, when he considers the idea of bio-medical engineering as a means of ensuring that only the physical and intellectual "best" are "bred."[56] The quality of his proposed solutions to preserving environmental space by efficient use and modifications of the land, again surpasses that of his predecessors. His modern sensitivity to the problem of man's ever-growing population, and of the social need, therefore, to preserve as much of the surface land for people and agriculture, manifests itself in Anticipations. Here he envisages the social and spatial benefits to be gained by transforming the land to accommodate travel via underground rail transport.[57]

The Theme of Continuity

Freedom to conduct scientific research and seek truth was a common desire in the utopias by Plato, Andreae, and Wells. "To learn the nature of truth"[58] is as important in Plato's utopia, as it is in Francis Bacon's "very eye of this kingdom"--Salomon's House, or Andreae's research institution and "innermost shrine of the city"--the College.[59] With regard to scientific research, Christianopolitans exemplify "an attitude of open, liberal questioning,"[60] while in A Modern Utopia, Wells insists that the scientific search for truth and knowledge must continue, unimpeded by custom or dogma.[61]

Just as important, however, and regardless of the varied quality or complexity of their scientific speculations, was their common desire that the scientific and technological achievements be intended for peaceful, non-military purposes. All expected these achievements to be used to improve mankind's social situation by offering constructive solutions to problems in (1) travel, (2) agriculture, and (3) modifying the land. Although Plato approves of military fortifications for defensive reasons,[62] he appreciates more those scientific efforts and engineering constructions that serve to better the lifestyle of people. In the Critius, he clearly marvels at the fact that the inhabitants of the "sacred island" of Atlantis used their scientific knowledge wisely, to domesticate and breed livestock, to farm timber, to explore and exploit natural mineral resources, and also to build socially beneficial structures including canals, bridges, harbours, and a well-planned city complete with public baths and accommodation,[63] rather than employed their technology to design aggressive military instruments.

Andreae, like Plato and Francis Bacon, also wants science and technology to be used constructively. The advances in travel and agricultural methods, the exploitation of land and natural resources, in addition to the building of fire-proof homes, are all intended to alleviate human suffering caused by hunger, overcrowding, or threat of fire. In Christianopolis, scientific and engineering progress clearly does not serve the creation of instruments of war "for while the world especially glories in war-engines, catapults, and other machines and weapons of war, these people look with horror upon all kinds of deadly ... instruments ...." In Bensalem, as well, "the aim of all knowledge is action in the production of works for the promotion of human happiness in the relief of man's estate."[64]

Wells shares the sentiments of the earlier utopists. He makes it clear in Anticipations that automotive transport, whether public omnibuses and transport trucks or private motorized carriages, is intended to serve social (either individual or business) rather than military purposes. He points out, for instance, that it can serve as a means to facilitate the transport of people and commercial goods, and one that will save both time and money. Such technical marvels as electric ranges are also looked upon as socially useful conveniences that, as time-saving devices, can offer citizens the benefit of greater leisure time.[65] Genetic engineering, moreover, is clearly meant as a peaceful solution to the sociological problems of defective births and overpopulation, while underground rail transport will provide, he hopes, a constructive solution to the social problems of urban (and rural) noise and overcrowding, by preserving the above-ground space for housing, parks, and agriculture.

POLITICS

The Theme of Change

The quality of the political friends and foes, as well as the motives for interregional and international alliances and rivalries presented in the literature, varied in ways determined by contemporary political biases and relationships. In the Critius, one is presented with a militarily and morally motivated conflict between two regions of Greece, the proto-historic Athens and her Greek allies, and the mythical Atlantis. The influence of the actual conflict in Plato's time, between the powerful, aggressive city-state of Sparta and his beloved Athens, manifests itself when Atlantis (representing Sparta), is eventually portrayed negatively, as the military aggressor that attacked the proto-historic Athens in its "pursuit of unbridled ambition and power." Underlying this military struggle is a moral conflict between a peace-loving austere Athens, whose Guardians, Plato tells us, were "recognized as leaders of the rest of Greece," and a hedonistic society that, because of its emphasis on material wealth, had been reduced to the less than God-like trait of "mammonism," ceasing "to be able to carry [its] prosperity with moderation."[66]

In contrast, Andreae, conditioned perhaps by bitter religious antagonisms evident prior to the outbreak of the Thirty Years War (1618), presented rivalries motivated mainly by religious beliefs, but with undertones of "national"[67] preferences also in evidence. In Christianopolis, Catholics (and Moslems) are portrayed pejoratively, as "non-believers," followers of "Anti-Christ, or Mahomet and of similar false prophets." Andreae insists that the true "Christian or Protestant City" of Christianopolis must struggle against and triumph over the Anti-Christ and Satan, aided by the "banner of the cross." In addition to this religious conflict, are hints of "national" rivalry. It is clear that English or other Protestants do not lead this religious fight in Christianopolis, for "in our own age" the struggle is conducted "under the guidance of [Germany's] great Luther."[68]

Distinctly modern forms of power-struggles, motivated by national and even mild racial prejudices, made their appearance in the transition to the nineteenth century English environment and literature of H. G. Wells. The influence of modern European imperialism and, accompanying this, overtones of cultural and phenotypic racism were clearly evident in his utopian works. In both Anticipations and A Modern Utopia, he proclaims that the English-speaking white peoples of England and North-America are the "best" in his physical and intellectual terms. Pursuing this line of thought, he maintains that since these peoples represent the "best," they, in alliance with the European and "Yellow" states, must dominate the inferior peoples and races of the world. With hints, moreover, of Social Darwinism, the blacks and the browns are definitely portrayed as the "inferior" foe who "cannot keep pace" with the "efficient" and "beautiful" white race. Wells's utopian works make plain his belief that the white race must struggle against these "inferiors," to control their breeding habits and contain their vast proportions, in order thereby to maintain a paternalistic form of white supremacy.[69]

The Theme of Continuity

Although moderate regional, national, or racial prejudices were found in the literature, all authors revealed, in their comments on war itself and foreigners, a common desire for both peace and international harmony, as well as a demand for liberal-humanitarian behaviour towards all peoples. Plato, prompted by an opposition to the political tyranny and war of his own times,[70] envisages a society in the Republic that rejects wars of aggression. Moreover, while it is true that he condones defensive military action[71] and appreciates the technological achievements of Atlantis, he makes it clear in the Critius that he disapproves of the Atlanteans' imperialism, and their inability to cope with their wealth: "when the divine element in them became weakened by frequent admixture with mortal stock, ... their human traits became predominant, [and] they ceased to be able to carry their prosperity with moderation," resulting in a unwarranted "attack [on] our country" in "pursuit of power."[72] The Critius also demonstrates Plato's disapproval of what one might call bigotry towards other peoples. Although he exhibits here a moderate form of regional preference, as he glorifies the leaders and people of his beloved proto-historic Athens,[73] and while he opposes the imperialism of Atlantis during its decline, he nevertheless initially respects that orderly society, and the agricultural and technological feats "produced by that sacred island." Far from conveying any inhumane "anti-Atlantean" attitudes, the Critius clearly reveals his appreciation for the nature and extent of their initial power and state of mind: "they retained a certain greatness of mind, and treated the vagaries of fortune and one another with wisdom and forebearance, as they reckoned that qualities of character were far more important than their present prosperity."[74]

Andreae also expresses the desire for peace and humane behaviour towards all peoples. The content of the education and the nature of the reception of visitors in his utopia both point to his opposition to war in general, and to those religious squabbles which led to the Thirty Years War in particular. In Christianopolis, education emphasizes "equality, the desire for peace, and contempt for riches, as the world is tortured primarily with the opposites of these," while visitors are warned against the evils of war: "for while the world especially glories in war ... these people look with horror upon all kinds of deadly ... instruments ... and they show them to visitors not without disapproval of human cruelty ...."[75] Christianopolitans also shun any virulent type of prejudice or inhumanity to other peoples. True, Andreae, like Roger Bacon, conveys a moderate form of religious bias and hints at linguistic preferences, or what could be called a type of cultural "nationalism."[76] Yet he, no less than Plato or his early modern contemporary Francis Bacon, trusts mankind to behave humanely to one another. In Christianopolis, therefore, the republic "of honesty and excellence," all travellers are greeted warmly and all strangers cared for. To Andreae, the real enemy is "Satan." Rather than be wary of foreigners, the people are warned to be "mindful of their spiritual armor, never expose their bodies, ... bare of virtues, to Satan, never through drunkeness and gluttony forget their watches, ..., and when he [Satan] takes offensive, repel him, strengthened with the spirit of God."[77]

Wells, too, demonstrates his right to be considered part of this peace-loving humanitarian tradition. He is clearly indicting nineteenth century imperialism when he condemns "modern war, modern international hostility," and insists that "were the will of the mass of men lit and conscious, I am firmly convinced it would now burn steadily for synthesis and peace." In fact, as a constructive alternative to war, his utopia invisages the creation of a politically and racially united World Republic.[78] His utopia, while it mirrors a belief in his own national, linguistic or cultural, and even racial superiority,[79] also reveals his definite opposition to any form of inhumanity towards other peoples and the "slavery created by imperialism." Here he clearly rejects "the modern Imperialist School [which] distinguishes its own race--there is a German and a British ... and a wider teaching which embraces the whole "white race" in one remarkable tolerance--as the superior race, as one, indeed, superior enough to own slaves, collectively if not individually." Even his elements of Social Darwinist racism mellow (or are contradicted) as he humanely proclaims, or "for my own part I am disposed to discount all adverse judgements and all statements of insurmountable differences between race and race." Indeed, "even the Australian black-fellow is, perhaps, not quite so entirely eligible for extinction as a good ... Australian white may think."[80]

PART III

CONCLUSIONS

The effort has been made to apply a model of technological utopianism to select examples of early scientific utopias, in order to determine if these works can be classified as technological utopias, specifically philosophical utopias, in which views expressed on (1) women, (2) scientific and political elites, (3) science, and (4) political affairs vary according to the authors' social milieu, while at the same time reveal a common desire for (1) social mobility, (2) social and scientific freedoms (in Bloch's tradition of Freiheit), (3) liberal-humanitarianism (according to Mannheim's definition), (4) social and scientific progress, and (5) peace.

Many[81] insist that liberal notions, as well as the idea of progress, were alien to Plato. It is true that liberalism, as a political philosophy, is a modern concept, as is the idea of progress. Yet the attempt has been made to suggest that for his times, Plato was quite liberal and progressive in his outlook on certain topics. His obvious desires for peace and humanitarianism, for the responsibility of the scientific community and the political elite, and for women's rights in education and important political positions,[82] only serve as signs of his socially progressive, liberal-humanitarian tendencies. Others[83] claim that he neither sought nor considered possible the realizability of the utopia described in the Republic. It is clear, however, that he hoped "the philosophers [would] become kings in our cities,"[84] implying his true utopian desire for the realization of his or a similar republican society. A. E. Taylor maintains, moreover, that "the real theme of the Critius is not the glories of Atlantis"[85] but a contest between Atlantis, which was inwardly foul in spite of its apparent splendour, and Athens, which was moral and wholesome. It is true that a moral conflict arose between proto-historic Athens and Atlantis upon the latter's decline. Nevertheless, it is evident that he respected the people of Atlantis, the extent of their power, and the fact that "they retained a certain greatness of mind" in spite of their prosperity. It is also clear, from his emphasis on the technological achievements and advances made by Atlantis, that Plato appreciated the marvels of this "sacred island,"[86] and the potential of science and technology to create a better society in the future. As Desmond Lee puts it, the Critius is an "exercise in the art of science fiction." As such, it is an "attempt to peer into the future and guess what man's growing control over nature may enable him to do." Although "Atlantis is situated in the past, it is nonetheless a society with an advanced material civilization, a construction by the imagination of what man's ingenuity could achieve,"[87] Ernst Bloch, furthermore, classifies his utopian works in a tradition of order.[88] Although, in certain architectual and political ways, the Republic shows signs of Plato's desire for Ordnung, or geometric and hierarchical structuring, aspects of his social thought clearly convey his desires for freedom, and vertical and lateral social mobility. The Guardians were selected on the basis of merit, not title, while women were freely offered educational and work opportunities.

Bloch classifies Andreae's Christianopolis, correctly, in the tradition of Freiheit. Yet he describe[illegible]he work as märchenhaft, as one presenting technische Wunschbilder.[89] This utopia, however, like those by Plato, is more than an example of a fable. It clearly reflects a desire to realize a new society, and one that offers social freedom and mobility, as well as freedom for technological development and scientific investigation to benefit man and glorify God. Segal claims that the utopias by Andreae and Francis Bacon cannot be considered true technological utopias because the aim of scientific research was to glorify the creations of God. Specifically, he insists that "their religious orientation ... sharply differentiates them from the secularly-minded technological utopianism,"[90] and for this reason they must be classified as mere precursors of technological utopian thought. It is, of course, true that in the works of Roger Bacon, Francis Bacon, and Andreae, scientific investigation was intended to reveal "the grace of God"[91] and re-confirm the Christian faith. However, religion and science, like humanism and science, are not necessarily mutually exclusive. Their attempt to glorify God's creation through scientific examination does not preclude their works from being considered technological utopias, any more than modern humanistic (Saint-Simonian) desires to improve man's estate through business-management, in addition to technology, deny their technological utopian nature. Nor do efforts to glorify God's handiwork negate or detract from the evident desire to "vaunt" science and technology as means to create a better society for mankind, in true technological utopian fashion. Regardless of whether science is subordinated to a higher humanistic (mankind) or moral (God) force, these religiously-minded men, no less than Plato, Condorcet, Saint-Simon, and H. G. Wells, envisaged science as a means of ultimately realizing a better world for mankind, and therefore all offered examples of "model" technological utopias.

To summarize, on the one hand, all showed the theme of historical change. The status and function of women, or the quality and diversity of jobs open to them, varied according to the authors' social milieu, as did the forms of discrimination. The professional quality of the elite changed from academics, to theocrats, to technocrats, while the social position of the scientist and engineer moved, in time, from third to first place in the social hierarchy. Now the personal and moral character of this scientific and engineering elite was heroically important in setting the moral tone of society. The quality of the technical solutions to technical and social problems varied in complexity according to the authors' time and place, just as the quality of the political friends and foes, as well as the motives for alliances and rivalries, whether regional, national, or racial, changed historically. On the other hand, however, all authors demonstrated that they belonged to a technological utopian tradition of freedom, liberal-humanitarianism, and progress. All showed a liberal respect for women by offering them opportunities in education and employment outside the home. Although the society may have been run by academics or theocrats, all societies held a high regard for the scientist and engineer, as well as for their accomplishments. At times, the authors exhibited a naiveté[92] regarding the positive potential of science and technology. Nonetheless, all demonstrated an awareness of the limits to man's knowing. As well, all advocated the need for mankind to be conscious of the problems of excessive technological and material growth,[93] while concurrently revealing their appreciation for the potential of science and technology as means of creating a utopia. Finally, all advocated peace and international harmony, as well as humanitarianism to all peoples, as the way of the future.

FOOTNOTES

CHAPTER TWO

[1] Refer to the introduction for definitions.

[2] A. E. Taylor, *Plato: The Man and his Work* (London: Methuen and Co. Ltd., 1948), p. 2. Also, the *International Encyclopedia of the Social Sciences*, 1968 ed., s.v. "Plato," by Karl Popper, p. 160; F. E. Held, introduction to *Christianopolis: An Ideal State of the Seventeenth Century*, by Johann Valentin Andreae, trans. F. E. Held (New York: Oxford University Press, 1916), p. 3; the *Encyclopedia of Philosophy*, 1967 ed., s.v. "Plato," by Gilbert Ryle, p. 315.

[3] Plato, *Timaeus and Critius*, trans., intro. and with an appendix on Atlantis by Desmond Lee (Harmondsworth, England: Penquin Books, Ltd., 1976); and "The Republic," in *Great Dialogues of Plato*, trans. by W. H. D. Rouse, edited by E. H. Warmington and P. G. Rouse, and summary of the *Republic* by J. C. G. Rouse (New York: New American Library, A Mentor Book, 1956).

[4] Desmond Lee, intro. to *Timaeus and Critius*, by Plato, p. 23.

[5] Desmond Lee, p. 48; Alice C. Gaar, abstract to "German Science Fiction: Variations on the Theme of Survival in the Space-Time Continuum" (Ph.D. dissertation, University of North Carolina: Chapel Hill, 1973); Ernst Bloch, *Das Prinzip Hoffnung*, 3 vols. (Frankfurt-am-Main. Suhrkamp Verlag, 1959), 2:764, 852.

[6] F. M. Cornford, *Plato's Cosmology. The Timaeus of Plato Translated with a Running Commentary* (New York: Harcourt, Brace and Co., 1937), pp. 5-6; and A. E. Taylor, *Plato: The Man*, pp. 437-38, 440.

[7] *Timaeus*, pp. 29-32, 39.

[8] F. E. Held, intro. to *Christianopolis*, by Valentin Andreae, pp. 12-13; and Nell Eurich, *Science in Utopia: A Mighty Design* (Cambridge, Mass; Harvard University Press, 1967), p. 134.

[9] Aptly described by Alice Gaar (p. 23). Nell Eurich (pp. 120-27) points out that other works by Andreae, such as the *Fama*, are also important to his utopian thought. This study, however, will look only at *Christianopolis*, which deals concisely with his utopian and scientific ideas.

[10] Jacques Barzun, Darwin, Marx, Wagner. Critique of a Heritage (New York: Doubleday and Co., Doubleday Anchor Books, 1958), p. 188; H. G. Wells, introduction to his The War of the Worlds (London: Pan Books Ltd., in association with William Heinemann Ltd., 1975); Roland Stromberg, An Intellectual History of Modern Europe, 2nd ed. (Englewood Cliffs, New Jersey: Prentice Hall Inc., 1975), p. 425; and Norman Mackenzie and Jeanne Mackenzie, H. G. Wells. A Biography (New York: Simon and Schuster, 1973), pp. 57-60.

[11] Including such literary science fiction works as The War of the Worlds and "The Time Machine," in Selected Short Stories (Harmondsworth, England: Penquin Books Ltd., 1975), pp. 1-83; as well as a dystopia, The Shape of Things to Come. The Ultimate Revolution (London: Hutchinson and Co., (Publishers), Ltd., 1935); and a survey of Western history, The Outline of History. Being a Plain History of Life and Mankind, revised and updated by Raymond Postgate and G. P. Wells, with maps and plans by J. F. Horrabin (New York: Doubleday and Co., Inc., 1971).

[12] H. G. Wells, Anticipations of the Reaction of Mechanical and Scientific Progress upon Human Life and Thought (London: Chapman and Hall, Ltd., 1904); A Modern Utopia (London: Chapman and Hall Ltd., 1905).

[13] Bloch, Prinzip Hoffnung, 2:510-11, 682.

[14] Roger Bacon, The Opus Majus, trans. R. B. Burke, 2 vols. (Philadelphia: University of Pennsylvania Press, 1928); Part of the Opus Tertium of Roger Bacon Including a Fragment Now Printed for the First Time ed. A. G. Little (Aberdeen: The University Press, 1912; reprint ed., Farnborough, England: Gregg Press, Ltd., 1966); The Mirror of Alchemy. Also a Most Excellent and Learned Discourse of the Admirable Force and Efficacie of Art and Nature. With Certaine other Worthie Treatises of the Like Argument (London: Printed for Richard Oline (?), 1597). Francis Bacon, "New Atlantis," in Famous Utopias. Being the Complete Text of Rousseau's Social Contract, More's Utopias, Bacon's New Atlantis, Campanella's City of the Sun, intro. Charles Andrews (New York: Tudor Publishing Co., 1950), pp. 233-72; The New Organon and Related Writings, ed. and intro. Fulton H. Anderson, The Library of Liberal Arts (Indianapolis: Bobbs-Merrill Educational Publishing Co., Inc., 1960). Antoine-Nicholas, Marquis de Condorcet, "Essay on the Application of Mathematics to the Theory of Decision-Making," in Condorcet. Selected Writings, ed. and intro. K. M. Baker (Indianapolis: Bobbs-Merril Co., Inc., 1976), pp. 33-70; "Fragment on the New Atlantis," in Condorcet. Selected Writings, pp. 283-300; "On the Admission of Women to the Rights of Citizenship" in Condorcet. Selected Writings, pp. 97-104; Sketch for a Historical Picture of the Progress of the Human Mind, trans. June Barraclough and intro. Stuart Hampshire (London: Weidenfeld and Nicolson, 1955).

[15] Republic, p. 253; Timaeus, p. 30.

[16] Timaeus, p. 30; Republic; p. 254.

[17] Critius, pp. 131, 133.

[18] Andreae, p. 260.

[19] Ibid., p. 157, 260-61.

[20] Ibid., pp. 208, 260. In Francis Bacon's utopia, as in Andreae's, women could teach. In contrast, however, to the limited opportunities in Christianopolis, women in Bensalem could also function in such unconventional and demanding roles as technicians in laboratory work ("New Atlantis," p. 271).

[21] H. G. Wells, Utopia, pp. 151, 187-88, 275-78, 281-82, 299; Anticipations, pp. 48-49.

[22] H. G. Wells, Utopia, pp. 186-90. 275.

[23] Many, including Marylin Arthur, "'Liberated' Women: The Classical Era," in Becoming Visible: Women in European History, eds. Renate Bridenthal and Claudia Koonz (Boston: Houghton Mifflin Co., 1977) and Barbara Kaplan, "Women and Sexuality in Utopian Literature" (Ph.D. dissertation, New York University, 1977), look at the negative portraits of women in utopian literature. Kaplan has written an excellent study that reveals a dichotomy between ideal and real images of women in utopian literature. She points out that, on the one hand, women have been portrayed ideally by such authors as Plato, F. Bacon, Condorcet, and H. G. Wells as intelligent and talented, while on the other hand, the realism of consistently negative images enters their thought. Women, for instance, are consistently portrayed negatively as emotional and distrustful (Plato, pp. 15-19; F. Bacon, p. 40) or weak (Wells, pp. 135-36). They are, moreover, expected to remain faithful in marriage for eugenic purposes (Plato, F. Bacon, and Wells) and are subjugated in marriage to the dictates of the husband. Although Kaplan demonstrates that negative images are consistent in utopian literature, she does not demonstrate "how" the discrimination in jobs and images changes according to the author's milieu. In the following examination of Plato, Andreae, and Wells, the emphasis will be on "how" and "why" the negative images vary in time and place.

[24] Republic, pp. 258, 341.

[25] Andreae, pp. 157, 180-81, 184-85, 188 ff., 260-61. Francis Bacon also patronized women, and suggested they were best suited to work in the home. Moreover, although he offered them work opportunities outside the home, as Andreae did, they were relegated to function in auxiliary positions, as technicians responsible to male researchers and theorists ("New Atlantis," pp. 254-56, 271). Inside and outside the home, therefore, women were both subjugated and discriminated against in the quality and quantity of their work opportunities, by these two authors of Protestant background.

[26] H. G. Wells, *Utopia*, pp. 108, 152, 186-90, 194, 294; Condorcet "On Women," pp. 102, 134-35.

[27] *Republic*, pp. 173-216, 249, 253. Bloch (*Prinzip Hoffnung*, 2: 562-66) claims that Plato's society "Ordnung utopisiert" because it consisted of *Kasten*, which prevented social freedom and mobility. It is clear, however, that Plato advocated social mobility regardless of sex, and indeed, regardless of class. See the *Republic*, p. 215.

[28] Andreae, pp. 157, 165-66, 205-208, 248, 260. In Andreae's society, such subjects as logic, physical education, grammar, oratory, modern and ancient languages, the humanities, and natural sciences were taught to both boys and girls. His advanced, liberal ideas on education even went so far as to offer sex education to the children, women of course teaching girls and men instructing boys. Moreover, it is clear that Andreae favoured social mobility according to ability rather than "blood," class, and, in a limited manner, gender (p. 165).

[29] H. G. Wells, *Utopia*, pp. 186, 200, 207; *Anticipations*, p. 103. Condorcet also demanded political (and social) equality for women. See *Sketch*, pp. 24, 54, 171-72, 183-84, 193, and "On Women," pp. 98, 100, 102, 134.

[30] H. G. Wells, *Anticipations*, pp. 48-49; *Utopia*, pp. 15[illegible] 275-77, 281-82; Condorcet, "On Women," pp. 102, 134-35.

[31] Bloch suggests that the aristocratic-military quality of Plato's utopian elite mirrors not only Plato's own background, but also the influence of the military monarchy of Sparta. It is possible that the "Brahmanen von dieser Welt" (the Republic and Atlantis) reflect the influence of Sparta's social order on Plato's thought (*Prinzip Hoffnung*, 2: 554, 562, 609).

[32] *Critius*, pp. 133, 141.

[33] Andreae, pp. 150-51, 179-80, 185-86, 200-201; F. Bacon, "New Atlantis," pp. 270-73, esp. 271. According to Eurich, doctors were a highly respected sector in the society of Christianopolis (p. 247).

[34] H. G. Wells, Anticipations, pp. 56, and 39-40, 83, 101; Utopia, pp. 259, 264-77. Like Wells, Condorcet also regarded the scientific community highly, according it a superior position in the social hierarchy of his utopia. In contrast, however, to Wells's scientists, Condorcet's scientific elite was to remain independent of the political and business professionals. Its decision-making was to concern only scientific matters, not those of political or governmental affairs. ("Fragment," pp. 285-87, 298; "Essay on Decision-Making," passim).

[35] Republic, pp. 170, 273; Timaeus, pp. 50-54; and Critius, pp. 135-36, 139.

[36] Andreae elaborated on a diverse number of specific scientific types. The list includes physicians, metal and mining engineers, astronomers, industrial engineers, chemists, horticulturalists, animal husbandrymen, scientific investigators and instructors, as well as scientific administrators, including the triumvirate's director of learning and the sciences, and the director of agriculture (pp. 150-51, 165, 174, 196, 200-201, 204-208).

[37] H. G. Wells, Anticipations, pp. 39-40, 83. Like Wells, Condorcet also acknowledged and defined distinct scientific and engineering types. See Sketch, pp. 7-8, 16, 132, 136, 151-160, 186-87, 202, and "Fragment," passim.

[38] H. G. Wells, Utopia, pp. 258-59, 276; Anticipations, pp. 58, 69; Condorcet, "Fragment," pp. 283, 285, 287.

[39] Republic, p. 273.

[40] F. Bacon, "New Atlantis," p. 241.

[41] G. Ryle, pp. 331 ff.

[42] Plato, Republic, pp. 131, 134, 173-216; Critius, pp. 136-40.

[43] Andreae, pp. 150-51, 157-58, 166-67, 174, 200-201, 205-208, 273-76.

[44] Wells, Utopia, pp. 150-53, esp. 151, and 33-34, 77, 94, 138, 140, 289; Anticipations, pp. 8, 13, 30, 35, 40, 83. Condorcet, in the technological utopian tradition, also expected the scientific and political elites to show scientific, moral, and socio-political responsibility. See Sketch, pp. 34, 172, 174-75, 180, 185, 188, and "Fragment," p. 293. In addition to scientific and political concern, Plato, Andreae, and Wells also demanded socio-economic responsiblity on the part of their political and scientific elites. Plato, to ensure the socio-economic responsibility of the political elite, and in opposition to the economic greed and exploitation of his own class, insisted that the Guardians live communally, receiving no wages and thereby accumulating no great wealth with which to exploit the lower echelons (Republic, p. 263). Even the military and political elites of proto-historic Athens could not become rich or exploitive (Critius, p. 131). Plato tells us that the lower echelons provided the elites of the Republic and proto-historic Athens with their basic needs and furnished them with an allowance for "there must be fixed allowances for them to be supplied by the other citizens as wages for their guardianship ..." (Republic, p. 216; Critius, pp. 131, 135). Again, as a means to prevent greed and exploitation by any sector of society through the accumulation of wealth, Andreae's Christianopolis discourages capitalists and forbids the ownership of money by any individual, whatever class: "no one has any money, nor is there any use for any private money; yet the Republic has its own treasury" (p. 161). Wells also opposed the accumulation of wealth by any one individual or group. In his utopia, government controls in the form of taxes, on inheritances for instance, ensure the social sharing of wealth (Utopia, p. 94; Anticipations, pp. 35, 83).

[45] Timaeus, pp. 40, 65-67, 70, 72, 88, 99, 106, 109, 112. This quotation refers to Plato's theory of forms, which claims that an original model of existence or a "thing in itself," created by some superior intelligence, is apprehensible only through the superior method of pure reasoning, while the imperfect copy of this model or the material world is understandable through the less reliable senses and opinion. The senses, moreover, such as visual observation or visual and practical testing, while an unsure empirical means to apprehend the truth, can also, Plato thought, function to distract the pure intellect and indeed hinder the seeking of knowledge. Sambursky suggests that Plato's preference for pure contemplation rather than experimentation and application in the sciences was due, one, to an aristocratic aversion to manual work, and two, to his opposition to materialist luxury and preference for "bare necessity" [S. Sambursky, The Physical World of the Greeks, trans. Merton Dagut (London: Routledge and Kegan Paul, 1956), pp. 226-27 ff.]. These reasons for his preference are acceptable. However, while it is true Plato preferred pure contemplation, the Critius nevertheless reveals his high regard for the social potential of technological development, and it is with his awareness of this potential that this section will deal.

[46] *Critius*, pp. 136, 138-40.

[47] Gaar, (pp. 59-60), Bloch (2:851-52), and A. E. Taylor, in his introduction to *Plato: Timaeus and Critius*, trans. with notes on the text by A. E. Taylor (London: Methuen and Co. Ltd., 1929), pp. 102-104, point out that the architecture of Atlantis reveals Greek and Babylonian influences. Taylor suggests that the hydraulic works are reminiscent of the Babylonian empire (pp. 132-33), while the naval works reflect the influence of those transformations made at Syracuse. Bloch, moreover, in an effort to demonstrate that Plato fits into his tradition of order, insists that, in architectural design (for example the circular canals), Atlantis exhibits a highly ordered, astrologically-determined city (*Prinzip Hoffnung*, 2:866). This is true. Nevertheless, the city-planning also reflects Plato's appreciation for the potential inherent in technological change and development to improve life socially, by creating a better, more efficient society for all.

[48] *Critius*, p. 138.

[49] Andreae, pp. 196, 204.

[50] F. Bacon, "New Atlantis," pp. 263-70. Roger Bacon also speculated on man creating "flying machines" and designing a means to travel underwater ("Art and Nature," in *Mirror of Alchemy*). His utopia envisages the technological creation of "wonderful things" such as:

> "instruments to flie withall, so that one fitting in the middle of the Instrument, and turning about an Engine, by which the winges being artificially composed may beate the ayre after the maner of a flying bird .... Moreover, instruments may be made wherewith men may walke in the bottome of the Sea or Rivers without bodily danger ..." (pp. 64-65).

[51] Andreae, pp. 150-52, esp. p. 151, 154-55, 203-204. F. Bacon's speculations on refrigeration processes as a means of preserving food ("New Atlantis," pp. 263-70), surpassed even Andreae's novel methods to improve food production and preservation.

[52] Andreae, pp. 154-55, 196, 199, 204. Eurich (p. 247) points to this modern aspect of his thought on science and industrial research.

[53] Wells, *Utopia*, pp. 119, passim; Condorcet, "Fragment," p. 284; *Sketch*, pp. 131-37, 149-50, 172, 202.

[54] Wells, "The Time Machine." In "Science Fiction," *Bild der Wissenschaft* 2 (1970), J. Asimov claims that a time machine "ist nach allem, was wir heute wissen, völlig unmöglich" (p. 117). However, the notion of time travel was not limited to Wells nor considered pure unrealistic fantasy. As James Bailey, in *Pilgrims Though Space and Time: Trends and Patterns in Scientific and Utopian Fiction* (New York: Argus Books Inc., 1947), points out, "the science of the late nineteenth century foretold not only of a Machine Age, but the advance of mathematics toward relativity. Before 1895, conceptions of travel in more than three dimensions and of space-time were common ... among mathematicians" (p. 70). The "Time Machine" reflects, then, the expansion of the human mind into theoretical considerations on actual physical movement into the realm of time. It remained for theorists and physicists, notably Albert Einstein and his theory of relativity, and Werner Heisenberg, with his "Uncertainty Principle," to formulate a theoretical basis for the concept of relativity, and with this, the time dimension and the possibility of time travel. See Albert Einstein's "Theoretical Physics," in *Science, Faith and Man: European Thought Since 1914*, ed. and intro. W. Warren Wagar (New York: Walker and Co., 1968), pp. 11-22 and Werner Heisenberg's "Science and Culture," Ibid., pp. 22-31. Wells's "utopian" speculations on time travel, therefore, while as yet not realized, are nevertheless perhaps realizable in the future. His speculations, moreover, are more advanced than those of Plato or Andreae.

[55] Wells, *Anticipations*, pp. 8, 13, 14, 44, 94.

[56] Wells, *Utopia*, pp. 162-64, 185-86. Condorcet realized the need to rationalize or mathematize farming techniques, and recognized the necessity of further research and improvements in crop and soil sciences, to increase the quantity and better the quality of food production. He makes clear his awareness that "a very small amount of ground will be able to produce a great quantity of supplies of greater utility or higher quality; more goods will be obtained for a smaller outlay .... Every type of soil will produce those things which satisfy the greatest number of needs ...." Unlike Wells, however, he never went so far as to speculate on improvements in mankind himself through genetic or breeding controls ("Fragment," pp. 284, 293; and *Sketch*, p. 187).

[57] Wells, *Anticipations*, pp. 8, 13, 14, 44, 94.

[58] *Republic*, p. 381.

[59] Andreae, p. 173; F. Bacon, "New Atlantis," p. 244. The College and Salomon's House are, what Segal calls, Andreae's and Bacon's "think tanks," in his "Technological Utopianism and American Culture, 1830-1940" (Ph. D. dissertation, Princeton University, 1975), pp. 9-10.

[60] Andreae, p. 129. Bloch correctly places Andreae's work in his technical utopian tradition of freedom or Freiheit. To demonstrate the correctness of his classification, he suggests that the primitive form of metallurgy practiced in Christianopolis, or the attempts to make "Gold aus Blei," reflects the "Mythologie der Befreiung" or the forces of change and freedom. In Bloch's words, the Christianopolitans' scientific research or "... Alchemie galt als die Mythologie dieser Befreiung" (Prinzip Hoffnung, 2:613, 744-45).

[61] Wells, Utopia, passim. Condorcet, of course, focused upon and emphasized this need for freedom, to ensure social, political, and scientific progress in opposition to "stifling" dogma or custom (Sketch, pp. 34, 172, 202, passim).

[62] Critius, p. 140.

[63] Ibid., pp. 134-40.

[64] Andreae, p. 192; F. Bacon, quoted by Fulton H. Anderson in his introduction to Bacon's New Organon, p. xxvii; F. Bacon, "New Atlantis," p. 269.

[65] Wells, Anticipations, pp. 8, 44, 94. Condorcet also looked upon science, technology, and medical research as peaceful means to improve man's social lot. Like Wells, he intended new instruments and machines to be used as non-military, time-saving devices to diminish man's labour. He speculated on the use of instruments to predict, if not control the weather, and thereby aid the general public, especially the farmer. Like Wells again, he looked upon scientific and medical research as means to improve man's social and biological environment through the control of diseases and the lengthening of his life-span, rather than its shortening in war. (Condorcet, Sketch, pp. 152, 157, 158, 161, 187, 199-200; "Fragment," p. 293).

[66] Critius, pp. 133, 142-43.

[67] It is true that as an idealogy, nationalism represents a modern, nineteenth century phenomenon. It must, however, be said that, no less than the influential Martin Luther, this seventeenth century Swabian minister, Valentin Andreae, expressed what could be called overtones of linguistic and religious "nationalism."

[68] Andreae, pp. 141, 150, 158, 165, 229-30, 234. His Lutheran prejudice becomes evident when he insists that "to what extent the heavens favor the Christian, and how he obeys the impulses of faith, are beyond the conception of the non-believers" (p. 230).

[69] Wells, Anticipations, pp. 100, 107, 114-16; Utopia, pp. 334-38.

[70] *Republic*, pp. 353, 362-63, 379. Taylor agrees that Plato, as a man of peace, opposed the tyranny of the oligarchical democracy of his times. Plato had originally wanted to enter politics: "his original aspirations had been those of the social and legislative reformer, not those of the thinker or man of science." The tyranny of the times, however, forced him into more academic pursuits (*Plato: The Man*, pp. 2-4).

[71] *Critius*, pp. 144-45; *Republic*, p. 170. Plato condones war, but only as a defensive mechanism. He demands that the republican city be large and "a whole army larger" in order, if necessary, to "go out and fight against all attackers in defence of ... all we have" (*Republic*, p. 170). He approves, moreover, of the Athenian defence of Greece against Atlantis, in the name of peace (*Timaeus*, pp. 37-38).

[72] *Critius*, pp. 142-43.

[73] Ibid., pp. 37-38, 129. He lauds the defensive action of the leaders and people of proto-historic Athens, and their consequent repulsing of the Atlanteans: Athens "bravery and military skill were outstanding ..., she overcame the invaders and celebrated a victory ... and she generously freed all others living within the "Pillars of Hercules" (pp. 37-38).

[74] Ibid., pp. 136, 142. Indeed, had Plato had no regard for Atlantis, he would not have spent so much time describing the positive features of this society.

[75] Andreae, pp. 192, 161, 237. Eurich even suggests that the translation of Christianopolis or "Caphar Salama" means "village of peace" (p. 129).

[76] Andreae, pp. 141, 150, 158, 165, 178, 229-30, 234. Andreae's Protestant bias is made clear by the fact that the religious leader of Christianopolis, Abialdron, is not a Catholic: the traveller "was admitted into the presence of the chief priest, not by any means a Roman pontifex ..." (pp. 179-80). In addition, and under the influence of Martin Luther's ideas, he anticipated modern linguistic "nationalism" in his contention that the German language is just as important as Latin or Greek in education, and for righteousness:

> "for he is not necessarily wise who speaks in this or the other language, but he who speaks with God. If righteousness and honesty are at hand, it matters little in what tongue they are spoken; if they are absent, it is of no advantage whether one goes astray speaking Greek or Latin. Too easily persuaded are they who attribute to the Latin language the power of making them better educated, rather than to the German." (p. 214).

Roger Bacon's Christian preferences, and his opposition to the infidel or Moslem manifest themselves in the *Opus Tertium* (pp. xxxv, xlv) and *Opus Majus* (pp. 633-34).

[77] Andreae, pp. 134-36, 140-41, 143-45, 192. Like the Christianopolitans, the Bensalemites also exhibit their humanity by offering "provision for the relief of strangers" and by telling the newcomers: "if you want fresh water, or victual, or help for your sick, or that your ship needeth repair, write down your wants, and you shall have that which belongeth to mercy" (F. Bacon,"New Atlantis," pp. 236, 240, 251).

[78] Wells, Utopia, pp. 87-90, 292, 350; Anticipations, p. 121. This World State would function in harmony with the local governments, which would control natural resources, justice, and labour. Condorcet, in contrast, implied that a world-wide political federation was a "puerile illusion." He nevertheless hoped for political equality and peace amongst nations, as well as for an association of enlightened men in a "Republic of the Sciences," unified by a common desire for truth and scientific progress, and by a common scientific language (Condorcet, "Fragment," pp.285, 287, 300; Sketch, 175-77, 184).

[79] Wells, Anticipations, pp. 100, 107, 114-16; Utopia, pp. 12, 17, 19-22. Unlike Wells, Condorcet expressed no form of phenotypic racism. He did, however, reveal his own moderate national bias as he alluded to the "greatness" of France ("Fragment," p. 287).

[80] Wells, Utopia, pp. 12, 17, 19-22, 334, 339, 340, 344-46, 351; Anticipations, pp. 69, 100, 121. His liberal-humanitarian opposition to virulent racism is revealed as he clearly states that "blacks," "Yellows," and "Jews" could become leaders or citizens in the republic (Anticipations, p. 121). Condorcet also exhibited a sense of liberal-humanitarianism. In the Sketch, he clearly and bitterly condems the European imperialists "murderous contempt for men of another colour or creed" (pp. 175-77, 184).

[81] Including Ralf Dahrendorf, "Out of Utopia: Toward a Reorientation of Sociological Analysis," in Utopia, ed. George Kateb (New York: Atherton Press, 1971) p. 106; J. B. Bury, The Idea of Progress. An Inquiry into its Origins and Growth (London: MacMillan and Co., Ltd., 1920) pp. 6-8, 19; and Karl Popper, "Plato," p. 162.

[82] Indeed, Plato's attitudes towards women were, in some ways, more modern than those of many men today.

[83] Such as Eurich, pp. 62, 67.

[84] Republic, p. 273.

[85] A. E. Taylor, introduction to Plato: Timaeus and Critius, pp. 6, 104-106. Taylor upholds this line of thinking in his Plato: The Man, pp. 439-40, 462. Cornford, too, suggests that the moral theme is the most important aspect of the Critius (pp. 361-64). Indeed, he emphasizes that Atlantis functioned mainly as the decadent, greedy antagonist to Plato's beloved Athens. Owing to this emphasis, however, he fails to recognize that Plato held both the technical knowledge and accomplishments of Atlantis, and its people, in high esteem.

[86] Critius, pp. 136, 142.

[87] Desmond Lee, appendix to the Critius, by Plato, pp. 148, 163.

[88] Bloch contends that the "soziale Wunschbilder" found in the Republic convey, in his terms, a hungering for "order." Specifically, he claims that "lange bevor die Freiheit ihren Staatsroman fand, hat Platons 'Politeia' Ordnung utopisiert" (Prinzip Hoffnung, 2:558, 566).

[89] Ibid., 2:731-32, 740-46, 759.

[90] Segal, pp. iii, 1, 8. His restrictive definition states that technological utopianism is "that mode of thought which vaunts technology as the means of establishing utopia for all mankind."

[91] Andreae, pp. 152, 187, 194; R. Bacon, Opus Majus, pp. 195, 633; Opus Tertium, p. xxxv; F. Bacon, "New Atlantis," p. 252. R. Bacon claimed that scientific knowledge "helps us to interpret the scriptures, both in the literal and spiritual sense." In like fashion, the director of learning and science in Christianopolis "insisted that a close examination of the earth would bring about a proper appreciation of the heavens, and when the value of the heavens had been found, there would be a contempt of the earth," while in Bensalem, research was "dedicated to the study of the works and creatures of God."

[92] Wells, for instance, thought that genetic engineering and "social surgery" would be socially beneficial. He failed, however, to anticipate their social misuse by unscrupulous leaders, like Adolf Hitler, who held virulently racist ideas. Condorcet, moreover, failed to realize that scientific instruments themselves could be limited in their capabilities and unable to yield the exact truth. (Wells, Utopia, pp. 143-45, 337-38; Anticipations, pp. 83, 107, 114-16; Condorcet, "Fragment," p. 284 and passim; Sketch, pp. 151-64, esp. pp. 154, 159).

[93] All, especially Plato, were aware of the "limits to knowing." Wells, moreover, was very conscious of the detrimental effects of excessive technological growth, and its negative by-products such as "noise and air-pollution" (Utopia, p. 135; Anticipations, p. 8). Even Plato presents more than a moral tale; indeed, elements of a modern dystopia become evident in the Critius when he attributes the decline of Atlantis to her technological and material excesses and immorality. Like Plato and Wells, Condorcet was also aware of the fact that social and scientific progress could be interrupted by some "natural cataclysm" ("Fragment," p. 300).

CHAPTER THREE

TECHNOLOGICAL UTOPIANISM:

The Modern German Literary Tradition

German society and culture were profoundly influenced by the social and political unrest of the modern era. Imperial Germany had faced domestic social disturbances from socialists. As a colonial power, engaged in political rivalries with England and France in Africa and the Orient, she had finally lost the Great War of 1914. After the war, the Weimar period witnessed internal social and political disturbances from the political Left as well as radicals on the Right. In terms of culture, Weimar society reacted with disillusionment to existing political, social, and scientific institutions and values. The scientific community also suffered as a result of Germany's war-time isolation from international scientific organizations, and the post-war inflation, which restricted travel and research. The Nazi period, of course, subjected German society to the setbacks of social revolution and military action.

In spite of these setbacks, German science remained undeterred in continuing to flourish in the tradition of Germany's rich scientific heritage. The imperial era had experienced tremendous strides forward in chemical research and industrial development.[1] The Weimar government and military establishments financed and encouraged rocketry research,[2] as well as research in atomic physics and related fields. The latter progressed at a phenomenal rate and was heavily subsidized by the national government, the provinces, as well as by private German and American firms and Japanese industrialists.[3] Indeed, the foremost names in airship and rocket development were mainly those of Germans and included Hermann Oberth, whose Die Rakete zu den Planetenräumen is a seminal work in the theory of rocketry, and for which he was acclaimed the "Father of Rocketry."[4] According to Fritz Haber, "without prejudice to the immortal individual contributions," Germany was the leader in atomic physics from 1919 to 1926.[5] The Nazi period, too, focused on atomic research and rocket development, with the well-known work of scientists like Wernher von Braun attesting to such interests.

In awareness, then, of the enthusiasm within German scientific, political, and industrial circles for scientific and technological research and development, one might well ask whether or not modern Germany's literary community was also stimulated by the tremendous surge of scientific activity? As it was, Germany had few men of literature who opposed the machine and science. Kretzmann claims that "in the first flush of its industrialization ... Germany welcomed the technological developments with unbounded enthusiasm. Some writers saw in these developments the most powerful human force, the root and common foundation of cultural progress."[6] Some post-1890 writers, moreover, proliferated a genre of literature aptly described as science fiction. It disregards the pessimistic, anti-scientific outlook of the neo-Romantic period, and maintains instead that nineteenth century optimism regarding scientific development. This literary genre also offers, it is proposed, examples of genuine technological utopias in the tradition of those already examined, although the former are of a literary rather than philosophical variety.[7] Before studying the "model" and its applicability to representative examples of modern German science fiction, it is necessary first to introduce the reader to the authors, and elaborate on the rationale behind the selection of these particular authors and their works of science fiction art.

PART I

THE AUTHORS: Their Lives and Works

Modern Germany has a rich science fiction heritage. The great number of German writers in this field dictated that the selection be based on the authors' fulfilling a set of six criteria. Kurd Lasswitz, Otto Willi Gail, and Hans Dominik were selected, in the first place, because of their gender. This is a relevant factor that becomes important when the study looks at the position of women in these German works and in utopias generally. In need of examples of "modern" German science fiction, the contributions by these three authors were logical choices because they represented, specifically, the Imperial, Weimar, and Nazi periods. In the third place, the choice was based on the fact that all three were and are popular writers in Germany and Europe, whose works have generated public interest in science. Martin Schwonke,[8] an apologist for the genre, suggests that Lasswitz and Wells are the foremost names in modern science fiction. He admits that Gail was also a very well-known contributor to the field. Hans Krysmanski, moreover, looks upon Dominik as a major author of German science fiction and one of lasting popularity.[9]

The accessibility of information on the education and professional backgrounds of the authors was reasonably substantial, and this determined the fourth reason for their being selected. Their professional or scientific, engineering, and technical training satisfied the fifth criterion. It is a significant criterion, and represents a training that qualified them to write works dealing with scientific and technological themes. Indeed, the nature of their professional backgrounds supports Hirsch's claim that it is "safe to say that as a group, science fiction writers contain a greater proportion with formal scientific training than is the case with authors of other types of fiction."[10] Finally, they were chosen because all were prolific writers of science fiction, whose works are composed in a literary or novel style that distinguishes them from the philosophical utopias of Plato, Andreae, and Wells. Furthermore, the works contain statements that indicate the authors' progressive, critical, and regressive views on the main topics for consideration: (1) women, (2) scientific and political elites, (3) science, and (4) international politics.

Kurd Lasswitz (1848-1910), considered by some[11] as the father of German science fiction, was born in Breslau in Silesia. Middle class in background, his father Karl worked as a civil servant in the Reich government. Kurd attended the Elizabethgymnasium in Breslau, studying mathematics and the sciences, before advancing to the University at Berlin for further studies (1868-1869). In 1873, he received his Doctor of Philosophy in physics. By 1900 he held a professorial position at the Gymnasium Ernestinum in Gotha, where he remained until his death.[12] As a philosopher, physicist, and mathematician, he was well qualified to write and, indeed, did write many scientific and scholarly works.[13] His numerous poetical works, essays, and _Märchen_,[14] which concern themselves with his views on human culture and mankind in the technological age, further reveal the great diversity of his intellect.

His abundant literary and scholarly outpourings are matched in profuseness by his works of science fiction, with which this thesis is concerned. For the purposes of this study, however, the emphasis will be placed on one particular science fiction work, Two Planets,[15] for the following reasons. Its date of publication (1897) proved a basis for its selection. Because we required a representative work from the German Imperial period, this very readable and thought-provoking piece of literature was an obvious choice. The fame and popularity of Two Planets also dictated its use. Its translation into nine European languages attests to its popularity and with this, its probable impact on the scientifically interested reading public.

The influence of Two Planets on later literary works, scientific thought, and the careers of future scientists was another factor in its selection. Its publication prompted a re-issue of Kepler's Somnium, which, apparently, was read by H. G. Wells and motivated him to create The First Men on The Moon.[16] The novel also had a direct impact on the scientific activities of German astronautical engineers and scientists like Wernher von Braun and Kurt Debus.[17] Indeed, the epigraph to the work was written by von Braun, who acknowledged its stimulating influence on his career. The story itself, revolving around the contacts between a superior Martian culture with that of earth, deals with Lasswitz's views on specific social groups, scientific values, and political affairs that are of concern to this study. While broad and thought-provoking topics such as free-will and the self-determination of peoples are considered, the contents (the events and descriptions) also act as indicators of the author's position on the four relevant topics. As well, they mirror his notions on the humanizing potential of science and technology, and his vision of what the new and better technologically-orientated society should hold for mankind.

Kurd Lasswitz has always been a popular subject for scholarly investigation. Yet Otto Willi Gail has also contributed some worthwhile works to the genre of science fiction. Otto Gail (1896-1956) was born in Gunzenhausen (Franken). In 1918 he graduated from the Technischen Hochschule München, later working as a specialist writer on technical topics and physics. He was associated with a number of newspapers before beginning a career with Munich radio (Münchener Rundfunk) in 1928.[18] He was a friend of the great German rocket scientist Max Valier, and was aware of the rocket research of Hermann Oberth.[19] As a scientist and technician in his own right, he was well qualified to write the numerous scientific works for which he is famous.[20] It is, nonetheless, his science fiction literature with which this study will deal.

Hans Hardt's Flight is somewhat juvenile in content and style. Nevertheless, it and The Shot into Infinity, along with the latter's sequel Der Stein vom Mond,[21] were selected for examination because we required characteristic examples of popular German science fiction from the Weimar period.[22] The works are concerned mainly with the construction of rocketships for space flights around the earth and to the moon. They are of significant value to the analysis in that they mirror the then latest advances in the art of space travel, considering, as they do, the then recent rocketry research of such noted American and German scientists as Robert H. Goddard and Hermann Oberth. At the same time, Gail's literature claims an idealistic faith in scientific progress and the humanizing potential of science, as it speculates that a "rocket (without passengers) will ascend to the moon, and Mankind is at the eve of a veritable new epoch in world history."[23] His novels are also useful because they contain both his progressive and his sometimes regressive or ideological views on the other topics pertinent to this thesis.

Hans Dominik (1872-1946) represents science fiction writers from the Nazi period. He was born in Zwickau and studied electrical engineering at the Technische Hochschule in Berlin before becoming a technical journalist.[24] With this solid scientific training, Dominik made a name writing technical articles and scientific texts.[25] It is, nonetheless, his contributions to the art of science fiction with which this study must deal. He was a prolific writer of science fiction. Here, however, we will focus solely on his Treibstoff SR[26] because of its one, popularity and influence on the reading public. Moreover, although the majority of his works were written during the Weimar period, this particular effort appeared in 1940, making it of significant value to the study as a requisite example from the Nazis' imperialistic (post-1935) era. The quality of its content was a third factor that dictated its use. The story, focusing on the creation of the correct fuel for and design of a rocketship to traverse the earth and fly to the moon, reflects Dominik's progressive views on the social benefits of science and space travel, and of the latter's feasibility. It also reveals his progressive and regressive views on the other three relevant topics.

The study, then, will emphasize Two Planets by Lasswitz in addition to the works by Gail and Dominik. Nevertheless, other works by Lasswitz, as well as contributions from Imperial Germany's Emil Sandt and Otto Schultzky, Weimar Germany's Thea von Harbou, Otfrid von Hanstein, and Walter von Heichen, and Nazi Germany's Rudolf Daumann, will be referred to on appropriate occasions to further substantiate an argument.[27]

We have examined the authors' lives and literature. It is necessary now to turn and apply the prototype, and also place the authors and their works in social and historical perspective. This will be done in order to demonstrate "how" and "why" the authors' views and attitudes on the relevant four topics mirror the "model" themes of (1) historical change from and (2) intellectual continuity with the utopian predecessors already examined. Continuity here means that tradition that advocates: (1) social mobility, (2) liberal-humanitarianism (Mannheim), (3) social and scientific freedoms (Bloch), (4) social and scientific progress, and (5) ideas of peace and hope for the future.

PART II

WOMEN

The Theme of Change

In contrast to the often narrow images of female qualities and abilities presented in the works of Plato and Andreae, the male (and female) authors of modern German science fiction, in the tradition of H. G. Wells, characterized women as capable individuals, able to function in a diversity of sophisticated roles. No longer were they portrayed in an image of one-dimensional breeder (Plato) or homemaker (Andreae), or restricted to just one (Andreae) or two (Plato) alternative life-styles to those of home-making and child-rearing. Instead, the reality of women performing numerous kinds of functions in a growing pluralistic society[28] clearly manifests itself as female characters represent such diverse social types as civil servants,[29] secretaries,[30] medical assistants, technicians, scientific researchers,[31] and engineers.[32] Their fictitious parts also mirror the reality of women now performing in more intellectually demanding roles, such as those of responsible decision-makers or highly competent and respected technicians and engineering specialists. We see that Lasswitz's female civil servants function as managing administrators in the mammoth Martian government. As well, the female medical and technical assistants to Dr. Hil, La and Se, are shown to be professionally competent in the medical care of Martians and earthmen, and qualified, as technicians, to operate and control certain sections of the complex Martian space station. In Harbou's The Rocket to the Moon, Friede is regarded as a highly skilled technician and specialist in complex film and photographic apparatus. In Mond-Rak, Hanstein portrays Irene as both a capable scientific researcher and rocketry technician, who is also well qualified to assist in the difficult operation and flight of spacecrafts.

In Lasswitz's Gegen das Weltgesetz, moreover, Lyrika earns respect for her skills as a specialist in the engineering arts. Indeed, in reference to the theoretical plans for the building of the deutsch-californischen tunnel, of all the hydraulic engineers on the project, "Lyrika war die einzige Person auBer Propian gewesen, zu welcher Atom einmal von Diaphot gesprochen hatte."[33] Another competent engineering specialist is Natalka. In The Shot into Infinity, Gail characterizes her as a technically capable, creatively original, and heroic individual. As an astronautical engineer, she imposes her own design on a rocket destined to fly to the moon, and wins the praise of her professional peer, engineer Korf, who recognizes her strength of will and intellect. While reading the heroine's log book, Korf realizes that:

> the cosmic and technical phenomena were judged with admirable accuracy, and the appended tables giving the readings of the measuring devices provided valuable scientific material. This woman had been terribly tried. The most refined torturer of the middle ages could not have devised these torments which Natalka had had to endure, in absolute solitude, in empty space. He could not refuse her his pity and his respect.[34]

This definite improvement in the way these male (and female) authors perceived the intelligence and abilities of women was consistently offset by the contradictory presence of distinctly modern forms of regressive attitudes. These were displayed in, one, more frustrating varieties of status discrimination, and two, modern kinds of negative images. The latter perpetuated the literary tradition of sexual conflict[35] concerning women's place in society. With regard to their status in the literature, female characters, if mentioned at all,[36] played, in the first place, non-leading or supportive roles. In Two Planets,[37] the main characters and scientists, whether Martians or earthmen, are men like Hugo Torm, Joseph Saltner, Dr. Hil, and Friedrich Ell. In the novels by Gail, women are again discriminated against. Here the heroes and leading scientists are represented by men like engineer August Korf and Dr. Samuel Finkle (The Shot into Infinity) or archeologist William Burns (Der Stein vom Mond). Representative science fiction from the Nazi period either exclude women and the possibility of heroines altogether,[38] or again, as in Daumann's Die Insel der 1000 Wunder, place male characters, like astronomer Dr. Rudolf Bracke and Professor Dr. Albin Hegar, in the heroic roles of chief scientists and engineers.

In the second place, women were relegated to frustratingly humdrum and static positions,[39] invariably incompatible with their true potential and desires. Few, if any, were allowed to taste lateral or vertical mobility and independence to their full extent. In spite of their education and talents, Lasswitz's female Martians, La and Se, are consigned to the medical and technical tasks "dictated" by male doctors and engineers.[40] Gail's female characters experience some job mobility, yet are still relegated to perform frustratingly humdrum work in the scientific and business world, not on a par with their intellect and education. Isabella is described as learned, with linguistic abilities in Spanish, English, and German, yet is deemed qualified to function only as a secretary: "es wird nicht schwer sein, sie als Sekretärin im Institut unterzubringen."[41] Harbou's Friede, despite her technical and photographic abilities, is not allowed to exploit her talents collecting photographic data of the moon flight. Dismissed to the role of cook on the rocket trip, Friede:

> obedient and cheerful ... detached her eyes from the contemplation of the marvels of the sky and set about the daily tasks which would enable them to carry out their work of exploring the unknown. She went to the place where the aluminum vessels were kept, and busied herself with the work of the first meal.[42]

Daumann's intelligent and educated Renate Veith is also the object of such discrimination and stereotyping when obligated, on the scientific expedition to the Tahitian volcanic craters, to work as the "Kuchenchef."[43]

In reference to the images of women, the modern German science fiction, while avoiding both harsh views of women as evil temptresses or villains and patronizing religious images associated with Mary, characterized them in new varieties of negativity. No longer were they viewed simply as the physically weaker sex (Plato), or as the respected mother and homemaker or contented and non-competitive teaching professional (Andreae). Now, and in the modern tradition of H. G. Wells, women of high education or professional status were looked upon as either threatening critics of or competitors to male dominance in the home and professional environment. Indeed, they were characterized as threats to the male ego and, thereby, evoked reactions of increased male dominance and jealousy. In Cavete, for her critical and independent spirit, for questioning her dependent and lonely position as the wife of Fritz Rufart, and for opposing, and by implication, competing with her husband's demands that her personality remain static, mindlessly expressing in public only his views regarding the rightness of his scientific work and search for truth, the highly intelligent Franziska incurs a reprimand from her husband: "man kann der Welt, ihren Interessen, ihrer Not dienen,--und seiner Frau doch immer bleiben, was man ihr immer war."[44] In The Shot into Infinity, Natalka is portrayed as engineer Korf's professional competitor, whose "feminine" drive and lack of professional integrity empowers her to steal his energy cartridge and complete her own rocket. Her active, competitive spirit is revealed when, criticizing Korf's unwillingness to accept foreign funds to build his rocket, she complains:

> You /Korf/ seemed satisfied with the scientific solution. But I longed for the deed--the great liberating deed, to make an epoch in universal history! It was a crime against mankind that national honor and trifling pride as a citizen meant more to you than this noble work. Nations rise and fall, ideas and opinions change in the course of time, but in the beginning comes the deed![45]

The Theme of Continuity

In the tradition of the early utopian works, the modern German science fiction consistently reflected a dichotomy between a regressive view of woman's nature and abilities, which, as we have seen, manifested itself in mildly negative images of women, and a progressive ideal view. The latter rejected and transcended any harsh or vicious images of women held by contemporary society,[46] and instead, ideally at least, appreciated woman's intellectual capabilities and her complex nature. This appreciation, moreover, and in accordance with the utopian tradition, was demonstrated by the authors' common demand that women, in equality with men, be offered the right of education. All the females in Lasswitz's Martian society are given equal educational opportunities. La and Se are shown to be highly educated in the areas of medical and rocketry technology. Gail's Isabella is portrayed as erudite, with a flare for languages, in particular Spanish, German, and English. Hanstein's Irene is characterized as a mathematics and science scholar, while Daumann's Ethelrid Quanson is, we are told, a well-educated secretary.[47]

This appreciation further manifested itself in the fact that women, again in the utopian tradition, were consistently accorded the freedom and mobility to use their education and, thereby, fulfil their true potential, as they functioned in intellectually demanding positions rather than those of homemakers or mere sex-objects. Lasswitz's Lyrika is a highly respected engineer who is allowed to play a salient role in the construction of the deutsch-californischen tunnel. Gail makes clear that Natalka, daughter of the Russian scientist Suchinow and co-owner of the rocket he and she designed, is well regarded by both her father and engineer Korf for her abilities as a rocketry design engineer. In consequence, she is able to function in this role, independently designing the initial rocket and alone piloting the pioneer test flight into space.[48]

ELITES

The Theme of Change

The modern examples of German science fiction presented a vertical improvement in the social status of the scientific and engineering community. The scientist, representing scientific research and values, no longer played a secondary (Andreae) or tertiary (Plato) role to theocrats or academicians in the utopian social drama. Nor did he share his now exalted social position with businessmen or financiers (H. G. Wells). Instead, the influence of the then growing social and political power of the scientific community in Germany, and of the professional scientific background and bias of each author[49] clearly manifested itself in the literature. Now, in all the relevant works by Lasswitz, Gail, and Dominik, technocrats or scientists, medical doctors, and engineers[50] are portrayed as the sole and unquestioned leaders and heroes in the society of the German science fiction.[51]

As it was with their position in the social hierarchy, so too did the (1) form (professional classification), (2) function (professional qualifications), and (3) content (personal qualities) of the members of the scientific and engineering community reflect historical changes determined by the German authors' modern social and professional background.

Like Wells, the modern German scientists-authors clearly distinguished the professional classification (or speciality) of each member of this now numerous cadre of scientists and engineers. The various doctors, scientists, and engineers portrayed in the modern German literature clearly showed the influence of both the modern German enthusiasm for scientific development, especially research in astronomy and rocketry, as well as the nineteenth and twentieth century growth in scientific specialists at technical schools (technische Hochschulen) and universities. In contrast to the vaguely alluded to "construction or civil engineer" of the Critius, and no longer simply anticipating the rise in technical and scientific experts (Christianopolis), these men of science represented actual modern-day scientific types or "specialists." Specialists like astronautical or space engineers, medical doctors, astronomers, zoologists, and medical and rocketry technicians are characterized in Two Planets. Gail's literature focuses on astronautical engineers, chemical engineers, medical specialists, psychiatrists, astronomers, and archeologists. Dominik's Treibstoff, moreover, concentrates on rocket engineers, atomic physicists, and engineering and rocketry technicians.[52]

The professional qualifications of these fictitious scientific experts, like those of Wells's scientific Samurai, were far more sophisticated and diversified. This modern urbanity manifested itself in the fact that they represented professionally multi-talented social types. Their abilities extended beyond the borders of the earlier type of simple "gentleman scientist"[53] into a realm that, in addition to their own particular area of scientific expertise, included other areas of either scientific, government, or business competence.

Lasswitz's Friedrich Ell, for instance, is shown to be capable not only as a research scientist and astronomer, but also as a diplomat. The professionally complex Hugo Torm embodies both the scientific community (as an astronomer), and the business and administrative world (as the Managing Director of Air Navigation for the Association of

Polar Exploration). Sandt's Fritz Rufart, like Torm, is not depicted simply a man of science (an engineer). Instead, he is described as qualified in both the realm of science and business, as the business manager of his own Luftschiff-Gesellschaft, and publisher and editor of his own socially and politically controversial newssheet, the Kosmopolit. Gail's and Daumann's characters, however, exemplify this type of highly complex, bureaucratized, business-minded scientist. Gail's August Korf portrays both the capable chief engineer of the Victoria National Airport at Friedrichshafen and creator of a rocketship that can fly to the moon, as well as a consulting engineer with and business manager of his own Korf Spaceship Company. Daumann's professionally diversified Professor Caffarelli, furthermore, depicts a botanist, experimenting with new varieties of edible fruits and vegetables, a physicist and hydraulics engineer, the inventor of "mechanical men," and a businessman, the administrator of his own Wellenkraftwerk.[54]

The personal qualities and moral fibre of this fictional scientific and engineering elite also commanded far greater social respect, and wielded far more social power. Unlike the case of Wells's scientific Samurai, these scientists did not share their position as social and moral guides in utopia with politicians and businessmen. Instead, an awareness of class and occupational conflicts among scientists, politicians, and financiers of the Imperial, Weimar, and Nazi periods,[55] as well as the influence of both the authors' deep antagonism towards politicians and businessmen and their own professional biases, made an appearance. Now the political and business communities were portrayed as villainous,[56] while the fictious business-minded scientists and engineers were consistently viewed as the class endowed with the benevolent heroic qualities required to function as models of proper social behaviour, and alone qualified to set society's moral tone.

In Sandt's Cavete, for example, a representative engineer demonstrates his sense of moral probity as he opposes the exploitation by and villainy of capitalists and politicians, and demands social and political Allgemeinheit or unity.[57] Engineer Rufart plays this aloof hero who, by means of his airship, is positioned above fictitious social and political intrigues. As he recognizes the lack of balance (Gleichgewicht) in German politics and society, he fearlessly clashes with the government's corrupt Oberpräsident von Nyuwstill and Baron von Schwind. He verbally opposes their political and military attempts to suppress the political influence of the workers and their leaders, and actualizes his opposition to such political villainy by rejecting their demands to use his airship as a military instrument to crush the working class.[58] Engineer Rufart is again portrayed heroically when he resists the efforts of the unethical kapitalistische Gesellschaft to exploit the working class and break up its "solidarity." His resistance is made clear when he utilizes the instrument of his newssheet Kosmopolit to champion the workers' right to unionization.

In the science fiction by Gail, we again see engineers set the patterns of moral and social behaviour as they heroically clash with political and commercial evil. Engineer Korf, when in a drive for funds, shows his distrust of myopic politicians when he proclaims "then I must simply turn to the public, councillor .... The masses will have more understanding than the narrowminded parliament."[59] The humanism of the scientist-hero is also contrasted with the callousness of the Roumanian businessman Vacarescu. Vacarescu is described as caring little for the life of the rocket pilot. Concerned only with his financial investment in the spaceship, the oil magnate demands: "For my money I can probably demand some guarantee too!" In his rebuttal, Korf questions: "Does not Skoryna guarantee matters with his life? .... Can one balance a human life with money. Even the life of an--an engineer like Skoryna?"[60] Similarly, Daumann's scientists, Drs. Hegar and Bracke, set this moral tone as they battle unprincipled businessmen. In Proturberanzen, prospector-businessman Bill Twards is described as a shady character, who steals money in order to invest in what he considers to be the commercially and, therefore, financially profitable scientific search for energy conducted by scientists Hegar and Bracke. The scientists, upon learning of his dubious background, his unscrupulous intentions for their research, and the suspicious origins of his wealth, reject his financial offers to seek reputable sources of funding.[61]

The Theme of Continuity

In the tradition of the earlier utopian works, the modern German science fiction condemned any highly politicized scientific community, and was opposed to the resultant inhumane commercialization or anti-social abuse of technology.[62] The literature made it clear that the authors trusted the ideally a-political[63] scientific and engineering elite to function in a socially, morally, and scientifically responsible manner, (1) sharing its medical and technological achievements and scientific knowledge with all classes of people, as well as (2) pursuing scientific truth in the name of and for the benefit of all scientists, and humanity in general.

In Two Planets, for instance, the Martians are expected to and do share such medical technology as the notion of an "oxygen injector," with the people of earth. In Utopia Island, Dr. Frank is shown to contribute his knowledge of "organ banks" and human organ preservation, with all their social and medical implications, to humanity. This he does in the hopes of profiting all people, not just a select few.[64] In Cavete, engineer Rufart idealistically proclaims that his airship must be used solely in scientific endeavours that benefit, democratically, all classes of people. He rejects financial offers from "unscrupulous men of commerce," who wish to exploit his technological accomplishment only to serve an elite for commercial gain.[65] In Mond-Rak, we again see an engineer make manifest his democratic humanism as he discusses the function of his spaceship and the value of his intended flight. Egon Helmstätter clearly expresses the sacrificial hope that, if the rocket flight is unsuccessful, he and his rocket might plummet to earth, affording humanity the opportunity to make use of the knowledge he will have collected and stored during his first and possibly final flight. Upon his successful landing, his words again voice his sense of social and scientific responsibility as they look to how "all" mankind might benefit from the scientific knowledge gained during the flight: "die Güte des Schicksals hat uns heimkehren lassen, jetzt drängt es uns, in wissenschaftlicher Arbeit, niederzulegen, was die Menschheit von unserem Fluge gewinnen könnte."[66]

In like fashion, the literature demonstrates that the investigation of scientific truth itself is meant to profit all, not just one scientist or a commercial or political elite. In Der Stein vom Mond, in reference to engineer Korf's rocketry research, Gail makes it clear that Korf: "leistet doch der Menschheit die größte Dienste." In his quest for the truth (Wahrheit), "er dient doch der Wissenschaft wie nie ein anderer vor ihm!"[67] In Dominik's Treibstoff, Dr. Hidetawa, knowing of the explosive nature of the rocket fuel, shares his knowledge about this problem with German scientists to ensure their safety.[68]

In accordance, moreover, with the nature of utopianism itself, as defined here and especially in Karl Mannheim's sense of the word,[69] the fictitious scientists and engineers, while they represented the "legitimate elite" of the new technocracy, nevertheless portrayed what was then an unrealistic role. Indeed, their fictitious position did not reflect the actual status of men of science and engineering in either the Imperial, Weimar, or Nazi society. Both Hortleder and Forman contend that during these three periods, scientists and engineers, in particular those outside academic circles, did not enjoy a relatively high social status as a class, profession, or group. They were not fully integrated into the society. In actuality political, business,[70] and military types took social and political precedence. Hortleder focuses on the late nineteenth and early twentieth century antitechnische Kulturkritik against this new Berufsklassen of scientific and engineering "upstarts." He points out that many engineers, whose views were represented by those of the Verein deutscher Ingenieure, opposed such criticisms and, realizing their own social and political impotence, jealously resented the political and social power of the political, military, and business elites. Many even expressed anti-parliamentary sentiments during the Weimar period, and opposed the Nazis' final seizure of power.[71] Forman[72] also points to the antagonism between the scientific community and other social groups in Weimar Germany, noting the bitterness on the part of both scientists and engineers over their actual lack of power and their sense of social isolation. The fictional scientific and engineering heroes, therefore, represented an elite whose actual position and influence as such, and, thereby, as a social and moral force, remained yet to be realized. They truly played utopian roles.

SCIENCE

The Theme of Change

Due, naturally, to the tremendous strides made in scientific and technological development in the nineteenth and twentieth centuries, and, in addition, owing to the authors' own scientific expertise, the quality of the suggested solutions to (1) technical problems in transportation (travel), as well as (2) social problems of (a) maintaining adequate food supplies (agriculture) and (b) making efficient use of the environment to obtain living space (modifications of the land), was far more sophisticated and realistic in the modern German science fiction than in the earlier utopias.

With regard to the nature of "travel" itself, the modern German authors clearly surpassed Plato's notions on mere improvements in modes of sea travel and even Francis Bacon's vague speculations on air travel, as they, like H. G. Wells, anticipated travel in space. The proposed methods to overcome technical problems such as wind friction, maintaining flight speed, and, thereby, reaching outerspace, as well as the overall designs of their spaceships, were also quite realistic. Indeed, they mirrored the actual problems, theoretical solutions, and spacecraft designs considered by contemporary rocket engineers, notably

Hermann Oberth, Robert Goddard, and Max Valier. In Two Planets, the Martians are shown to have overcome the technical problem of speed and navigation in their airships by means of a form of nuclear propulsion. Their airship Repulsit is equipped with highly refined rockets that release "condensed ether" at intervals to provide the initial propulsion thrust necessary to maintain speed and ensure maneuverability.[73] In Hans Hardt's Flight, Gail describes a rocketship that is a highly efficient "bullet" shape, to cut down on wind friction and ensure speed and navigational control while in flight.[74] To overcome the problem of actually "lifting-off" and gaining flight propulsion, this spacecraft uses an adequate supply of a refined rocket mixture consisting of alcohol, oxygen, and hydrogen.[75] The space vehicles described by Dominik lack the precision of those considered by Lasswitz or Gail.[76] Still, he, like Gail, realistically focuses on the need for both a volatile complex fuel, as well as an exact formula of this "atomic" fuel mixture or "radioactive cathode substance," if space flight is to be both safe and of successful duration.[77]

The greater sophistication of the modern German authors' scientific outlook with regard to travel was again revealed in their works. This time, they went beyond Plato's proposals to build docks and carve out ringed canals as a way, simply, to improve travel via water around Atlantis. Instead, they speculated on the creation of highly complex stations in space as a means to facilitate the technical problem of transport between earth and other planets like Mars and Venus. Lasswitz, describing the form and structure of the Martians' station, elaborates: "there hovered in space a strange station, a ringlike body in the shape of a huge wheel ...," consisting of Stellit to resist gravity, and creating an area between the ring and the polar island, Ara, that served as an abaric field or field of no gravity. This field, moreover, facilitated travel between Ara and the station by means of "a flight vehicle ... constructed" for this purpose.[78] Gail, conveying engineer Korf's feelings of satisfaction upon the completion of his own space station or man-made satellite near the moon, has him proudly proclaim: "diesen Mond habe ich gebaut. Es ist Astropol, unser Ziel."[79]

With reference to new and progressive ways in farming or "agriculture," the German authors again surpassed the outlook of their utopian predecessors, who sought only to improve methods of agricultural production (Andreae) or freeze existing food supplies (Francis Bacon). Instead, they speculated on the actual "synthesis" of food as a means to solve the social problem of maintaining adequate food supplies. Lasswitz tells us that the denizens of Mars have eliminated the basic sociological problem of hunger by the inexpensive "synthesis" of food from chalky mountains, loam soils, and rich mineral veins:

> Stones to bread! Protein and carbohydrates from rocks and soil, from air and water without the photosynthesis of the plant cell! This was the progress by which the Martians had emancipated themselves from the early cultural stage of farming and how they became the direct sons of the sun.[80]

While the materials from which the Martians supposedly create their food may seem rather fanciful, the idea of synthetic foods, no less than synthetic dyes, is not unrealistic. In its technological and scientific sophistication, moreover, this proposal distinguishes itself from those of either Andreae or Francis Bacon. Daumann describes how Professor Caffarelli's novel method of farming makes use of various chemicals to grow food (in particular fruits, nuts, and vegetables) in a temperature-controlled growth-chamber (Klimaanlage). Like that of Lasswitz's

Martians, furthermore, Professor Caffarelli's answer to the social problem of hunger also includes a plan to build a complex "food fabricator" or synthesizer, to ensure adequate quantities of food.[81]

With regard to speculations on "modifications of the land," our science fiction writers far surpassed simple proposals to just re-shape the land itself (Plato, Andreae, or Wells), when they looked at the idea of man-made islands, and even the development of space colonies as solutions to the social problems of inadequate living space caused by increasing populations. Both Lasswitz and Hanstein consider complex environmental transformations, like man-made islands in the sea, as a way to create new areas for collecting solar energy, research, testing rockets, and habitation. In Two Planets, Lasswitz focuses on the Martians' use of Ara as both a base for their polar research and a collecting centre for solar energy. He points out that "this creation of the Martians was, of course, not a natural island. Rather, they had built into the inland sea, which they found at the North Pole, an artificial island, or better, a floating raft of enormous dimensions ...." In Mond-Rak, Hanstein elaborates on Egon Helmstätter's unique Nova Isle, clarifying that it serves as a private place for Egon to conduct his rocket research and test his rocketship.[82] Hanstein, Gail, and Dominik, moreover, look at the notion of space colonies as an answer to the problem of human living space. Hanstein's Egon Helmstätter is shown speculating on the discovery of new inhabitable planetary worlds: "Astronomen, die das Weltall durchforschen, [werden] vielleicht die Bewohnbarkeit anderer Weltkörper feststellen."[83] We see that Gail's engineer Korf also hopes to discover habitable planets in space for man to peacefully colonize. Like Korf, Dominik's Dr. Hegemüller "dreams" of further space travel beyond the moon, and of landing on other uninhabited planets in order to explore, colonize, and develop them.[84]

In awareness, moreover, of the need to obtain ample supplies of energy for heating, running factories, and sustaining life, and recognizing the inefficiency of coal as a fuel, as well as the social problems created by its being detrimental to health, the German authors looked to the sun and the sea as relatively safe solutions to the social problem of alternative sources of electrical, mechanical, and heat energy. These were solutions to social concerns never even conceived by their predecessors. Lasswitz's Martians are shown as already devoted to solar power. They collect it from established radiation centres on the high Martian plateau and from the roofs of buildings, and then convert it directly to electricity. As a means of sustaining life on the space station and polar island, the rings of the station absorb the sun's radiation directly, channelling unused portions to the polar island to generate energy. Indeed, the Martians recommend that mankind use solar power in order to live not "on the capital but on the interest."[85] We see that Gail's engineer Korf has designed his space station, Astropol, with one reflector, which concentrates and directs some of the sun's heat energy towards earth. As he looks through his telescope on the station, Korf, we are told, can see that "konzentriertes Sonnenlicht liegt in blendender Helle auf dem Meerespiegel. Glasklar das Wasser /the Atlantic Ocean/. Tief hinab unter die Oberfläche sieht man aus dieser ungeheuren Höhe."[86] It is clear that Daumann's Professor Hegar also seeks to tap the energy of the sun. His main concerns, however, lie with that energy stored in the Protruberanzen of volcanoes and released during eruptions. In some distant future he hopes to be able to channel this force, to ensure that mankind has unlimited supplies of heat and electricity for homes and factories. Daumann's Professor Caffarelli, on the other hand, converts the energy of ocean waves (Wellenkraft) into usable electricity to run his machines (Kraftmaschinen), and heat the Klimaanlage in which he grows the island's food supply.[87]

Furthermore, the technocratic society conceived by these modern writers was, naturally, far closer to realization than that envisaged by Plato or Andreae, owing to the greater freedoms and the state of scientific knowledge in the twentieth century. The idea of a society in which rocket travel is a reality was not as fantastic in the early twentieth century as it may seem, or as air travel was at the time of Francis or Roger Bacon. As Willy Ley proclaimed in 1928, space travel was no longer mere fantasy for "der Weltraumrakete gehört die Zukunft!"[88] The use of such innovations as man-made islands and space stations or moon-bases[89] to serve rocket research and space travel was not far-fetched either.[90] Nor was the notion of synthetic food mere food for thought. If man could create synthetic dyes with his knowledge of organic chemistry, why could he not synthesize his nutrition out of the elements around him?[91]

The social and technical use of radiant and ocean wave energy was also far from a fantastic notion. Indeed today, solar power is considered as a last alternative, and one far safer than nuclear energy as a source of power to heat or operate homes and factories. The idea of space colonies, moreover, as a solution to the over-population problem and as a means to knowledge, was and is not implausible. All these notions and technological innovations, and with them the technological utopia itself, were considered realistic. Lasswitz clearly conveys his futuristic sentiments, and what would be those of Gail, Hanstein, Daumann, and Dominik, as he anticipates that time when the ideal, technologically-orientated society of the Martians has actually been achieved by mankind: "mathematics and natural sciences had reached a climax in their [the Martians'] development which looms before us humans, as a distant ideal."[92]

The Theme of Continuity

In the tradition of the earlier utopists, the modern writers emphasized a desire for freedom in society to conduct scientific work and seek truth.[93] Like their utopian predecessors, they also adamantly opposed any form of military abuse of technology. Their opposition, moreover, clearly alluded to actual attempts by political and military establishments of the Imperial, Weimar, and Nazi periods to exploit technology and scientists for imperialistic purposes.[94] It also revealed their demand that scientific work in general, as well as the specific technological solutions to problems in (1) travel, (2) agriculture, (3) modifying the land, and (4) maintaining energy supplies, be intended to serve mankind and peace.

The intended use of air and spaceships, for instance, in addition to the stated purposes of air travel and space exploration themselves, clearly demonstrated these peaceful, non-military desires. In the literature, they served only (1) scientific, (2) cultural, and (3) social or (a) space colonizing and (b) commercial purposes. In Two

Planets, the flight of the German scientists to the North Pole in their air balloon[95] is used solely as a way of obtaining valuable scientific knowledge on the polar region, to reward both scientists and ultimately all mankind. Astronomer Grunthe's proposed "toast to humanity"[96] upon arrival at the Pole emphasizes the altruistic intentions of the earth scientists' polar expedition. The purpose of the Martians' landing at and exploration of the Pole is also meant to be interpreted in peaceful responsible terms, as a means of enriching their scientific knowledge of other planets, as well as contacting men of earth in order to conduct interplanetary cultural exchanges. While at the Pole, they conduct anthropological research on "Kalakek" or Eskimo speech and culture, storing such information in their vast space station library.[97]

Gail recognizes the scientific value of air travel and space exploration, but also considers their social or commercial value. In Der Stein vom Mond, engineer Korf's peaceful commercial intentions are made clear in his plan to adapt the rocket principle to airplanes in order to create a more efficient commercial air travel service: "Sei es als Rakete wie im 'Geryon' oder als Flugzeug wie eben jetzt," Korf and his technicians "haben einfach das Raketenprinzip auf die gewöhnliche Luftschiffahrt angewandt." In The Shot into Infinity, his thinking is on a grander scale:

> The first aim of my space ship is the encircling of the moon .... And we may rightly hope that in no distant time it will be possible to pay comfortable and safe visits, within travelling times possible for human beings, not only to our near-by moon but also to the neighboring planets Mercury, Venus, and Mars ....[98]

Dominik looks at the commercial, scientific, as well as the social or colonizing value of rocket powered air and spaceships. In

Treibstoff, the German (Dr. Hegemüller), Italian (Drs. Billiari and Ruggero), and Japanese (Dr. Hidetawa) scientists co-operate to form an Interessengemeinschaft and later a Raketengesellschaft. Each contributes his scientific expertise to create "eine Flotte von Raketenzeppelin," which offer, no less than Korf's speculated passenger ships, speed, comfort (Bequemlichkeit), and ease of world-wide commercial travel to passengers from all nations. Drs. Hegemüller and Hidetawa, moreover, consider the rocket's scientific value as they initially intend to make a rocket-powered Weltraumflug to and around the moon, to observe and study it and its craters. Dominik definitely transcends the Third Reich's emphasis on military technology when he makes it clear that Dr. Hegemüller's ultimate goal is to explore space further, land on other planets, and seek scientific knowledge regarding their environment and habitability.[99]

The space stations only functioned as more proof of the German authors' hopes for scientific work to benefit humanity socially and scientifically. The stations were clearly created as a means to facilitate space travel, not as "military satellites." Lasswitz shows us that the Martian station is employed both as a "landing dock" for shuttle service between Mars and the North Pole, as well as a structure to channel solar energy directly to the polar island. Gail informs us that Hans Hardt's space station is meant to function as an international place of scientific research. It will house researchers, machines, and computers, and also provide, like that of the Martians, an area for reflectors that can collect and direct solar energy to the earth: "Mankind will be unaffected by diminishing resources and will have no further need to take up arms. Plenty shall prevail on the earth, and a fortunate species of man shall be permitted to develop in unity and in liberty." In like fashion, engineer Korf's Astropol serves only as a "landing dock" to house the men and equipment necessary to service space ships travelling from earth to explore other planets: "die Platform im Raum, die wir als erste Grundbedingung für die Weiterentwicklung der Raumschiffahrt brauchen." Hanstein, moreover, is quick to point out that Egon Helmstätter's moon-base will act as a base from which men can exploit the moon itself. It will also function as a port of call or Zwischenhafen for further spaceship travel and exploration of the universe, in the peaceful search of knowledge, natural resources, and colonies:

> Es wäre gigantisch, auf den Mond eine Sternwarte zu errichten und, ohne durch unsere Luftsschicht behindert zu sein, die Sterne und ihre Lebensbedingungen erforschen zu können .... Den Mond gewissermassen als Zwischenhafen, sagen wir vielleicht, um irdische Verhältnisse in das Gigantische des Weltalls zu übersetzen, den Mond als Ende des irdischen Vorortsverkehrs, von dem aus die groBen, endgültigen Weltraumschiffe zu den anderen Planeten hinüberfahren.[100]

The scientific and technological answers to problems in agriculture, in addition to the designs to modify the environment (man-made islands) and notions of space colonies, again made manifest these same anti-martial humanitarian intentions for scientific endeavours, in the tradition of the utopian predecessors. The Martians and, therefore, Lasswitz clearly look upon their notion of "synthetic food" as a means to assure sufficient quantities of food for all, whether Martians or not. With this technology, the Martians claim, the people of earth can be "emancipated ... from the early cultural stage of farming," and freed of the menace of drought. Professor Caffarelli and, thus, Daumann both consider Klimaanlage farming and the manufacture of food to be peaceful, non-aggressive ways of securing sufficient quantities of food (*Nahrung*) for all people, and, thereby, of improving mankind's social situation, not just that of Germany, Italy, or the military.[101]

Lasswitz, moreover, clarifies that the Martians' polar island (*Ara*) was constructed to serve simply as "a floating raft of enormous dimensions which was to carry their gigantic electromagnets," and to function as their earth base, from which they could peacefully explore the earth, conduct scientific research, and learn about earth's culture. Hanstein also readily points out that Egon Helmstätter's *Nova Isle* is intended only as a place of study or research facility, and as an isolated and, therefore, safe area to conduct rocket experiments.[102] August Korf, furthermore, and with him Gail, as well as Dr. Hegemüller and, therefore, Dominik, envisage the peaceful exploration of uninhabited planets in the name of science. They also look upon their eventual colonization and development as a non-militaristic solution to the social problem of overpopulation and the threat of dwindling living space.[103] Similarly, engineer Helmstätter and, naturally, Hanstein believe that mankind's exploitation of the moon, and his subsequent expansion into the galaxy, will lead to the discovery of food, living space, natural resources, and knowledge. Helmstätter aims to use the:

> Mond ... als Zwischenhafen ... um irdische Verhältnisse in das Gigantische des Weltalls zu übersetzen ... von dem aus die groBen, endgültigen Weltraumschiffe zu den anderen Planeten hinüberfahren. ... Von diesem sicheren Hause aus könnten Bergingeniere in die Tiefe des Mondkörpers eindringen. Unter der Eisrinde, deren Dicke wir nicht zu bestimmen vermögen, ist ein fester Kern. Wer weiB, woraus er besteht. Er kann kostbare Metalle, er kann sogar Metalle bergen, die uns noch gar nicht bekannt sind und die die Wirtschaftsverhältnisse auf der Erde in vollständig neue Bahnen lenken. Eben der Umstand, daB hier und im Weltall die Schwerkraft kaum mitspricht, macht es ja möglich, gewaltige Lasten spielend vom Monde zur Erde zu bringen.[104]

Finally, the modern authors meant the exploitation of solar and ocean wave energy to serve as a positive, non-violent, socially beneficial solution to the social problem of obtaining and maintaining adequate supplies of heat and electrical power for man-or Martiankind. Lasswitz informs us that on Mars, the Martians convert radiant energy to electricity for public or home and industrial consumption, while on earth, they use solar power only as a means of maintaining their space station and sustaining life at the Pole. Indeed, "the entire island was in a sense a gigantic electromagnet powered by solar energy itself."[105] Gail's engineer Korf also seeks to use his "solar reflector" in the service of humanity. He reveals his peaceful intentions when he claims:

> As my final purpose I intend to render the inexhaustible heat energy of the sun serviceable for mankind. Far out in space, at the limit of the earth's gravity, power stations shall arise, immense solar reflectors, making possible the concentration of gigantic amounts of energy at any desired spot on earth .... Mankind shall be made independent of the decreasing coal supply of the earth, and any preparation for war can be nipped in the bud. Wealth and happiness shall come to the earth and let a joyful human race develop in unity and freedom. That ... is the final purpose of my invention.[106]

Daumann's Drs. Hegar and Bracke share these views. Both want to exploit solar and volcanic power in the hopes of overcoming the world energy shortage and, thereby, ensuring that cold areas of the earth, whether in Germany, Norway, Sweden, or Canada, have inexhaustible sources of heat energy. Professor Caffarelli, moreover, expects to tap and convert ocean wave energy (Wellenkraft) into mechanical and heat energy, to furnish his island and ultimately mankind with an inexpensive and practical way to run machines.[107]

POLITICS

The Theme of Change

The nature of the political and social conflicts presented in the modern German science fiction exhibited (in the tradition of H. G. Wells) a concern with modern power politics. Consequently, they showed the emergence of a new stage in the idea of power. Whereas the ancient Greeks had been concerned with the rivalries of city-states (Plato), and later Andreae had alluded to Reformation antagonisms of Lutherans and Roman Catholics, the modern authors demonstrated an interest in the actual nineteenth and twentieth century Anglo-German political and military rivalries. German nationalism and an anti-English bias made their appearance as England or her representatives were consistently portrayed as the villains, devoid of all sense of morality and scruples.

In Two Planets, for instance, Lasswitz reveals an antagonism to England typical of the Imperial age. He portrays an English naval captain as a "reckless" culprit who fires upon the Martians' airship, provoking them to issue an "ultimatum" that demanded "rights of sovereignty" to the North Pole. He continues to characterize the representative Englishmen in negative images. Now it is both their "irresponsible" resistance to the Martians' overtures of peace, and their "stubborn" rejection of a Martian ultimatum that prompt a war between earth and Mars and the creation of a Martian military "Protectorate" over earth.[108] In The Rocket of the Moon, Harbou also betrays anti-English attitudes. Here she portrays English businessmen as "unscrupulous" villains who try to steal the rocket plans of the German scientist Wolf Helius, for the sake of their own exploitive, capitalistic ends. Gail, moreover, in Der Stein vom Mond, depicts the English as untrustworthy "spies" and "saboteurs."[109] In Der Insel der 1000 Wunder, Daumann displays the anti-British views characteristic of the Nazis' post-1935 imperialistic era. Englishmen, represented by the character of Winston Bird and his followers, appear as a band of murderous thieves or "Seeräuber" who attempt to disrupt the good work of Professor Caffarelli and steal his rocketcraft (Raketenapparat).[110]

The reasons, furthermore, for international hostilities went far beyond the relatively simple moral and military disputes between proto-historic Athens and a fictional Atlantis, or the religious conflicts of Protestants and Catholics appearing in Andreae's utopia. Instead, real,[111] modern, and complex motives, concerning (1) political, (2) military, and (3) economic issues, or (4) the suspicion of scientific and industrial espionage, were mirrored in the German science fiction. In Two Planets, military threats of a Martian invasion, as well as the suspicion that the Martians had killed two English sailors, prompt the military conflict between the English navy and the Martians.[112] The threat of the financial control of German scientific endeavours by foreign investors is yet another or economic motive for antagonism, and one very much evident in the Weimar science fiction. In The Shot into Infinity, engineer Korf, although in need of capital for his rocket development, resists the overtures of the unscrupulous Roumanian financier, Vacarescu:

> I would rather destroy my whole invention than let this, too, go to some foreign country. Isn't it enough, in case of a new world war, that the Americans threaten us with our own Zeppelins, that the Japanese rule the seas with our Krupp cannon, and that the French are making

> steel with our Saar coal? Truly, other countries are equipped with our own best weapons, so that they can attack us at will, if an occasion arises. No ..., my spaceship must and will remain a German national affair.[113]

Scientific espionage or sabotage and theft are also grounds for international friction. In Gail's *Der Stein vom Mond*, tension is created when technician Grundlach accuses archeologist Burns of sabotaging the voyage of the ocean vessel, *Bojador*, and interfering in the voyage of Korf's spaceship, *Venus*: "Dieser Engländer könnte ein Spion sein, der den fatalen Zwischenfall auf dem Meere ausnützte, um Aufschlüsse und Erklärungen zu expressen, die er sich dann von irgend einer Londoner Zeitung schwer bezahlen lieB." In his *The Shot into Infinity*, hostilities are aroused when Korf discovers that the Russian engineer Natalka, while working in his laboratory, had stolen his notion of a dynamic energy cartridge for her own rocket: "she had come to him as a spy, to listen to his ideas, to copy his invention, to steal his intellectual possession in a common tricky way!"[114] In Dominik's *Treibstoff*, moreover, antagonisms arise among the German, Japanese, and Italian rocket scientists. Here the Germans Dr. Thiessen and engineer Grabbe accuse both the Italian engineer Billiari and the Japanese technician Saraku of the theft of the first German rocket, and maintain that the Japanese technician Natahira had absconded with the Germans' secret fuel formula.[115]

The quality of the allies and alliances also mirrored "modern" contemporary circumstances, just as it had in Wells's fiction. No longer was the situation one of an alliance amongst Greek city states (Plato) or Christians, specifically German Protestants (Andreae). Instead, the fictional alliances were between modern nation-states where, representing actual political and scientific alliances amongst Germany, America, Italy, and Japan,[116] Americans,[117] Italians, and Japanese were consistently portrayed in positive images, as either (1) scientifically aware, adept, and co-operative, or (2) financially generous. In Two Planets, Lasswitz portrays the Americans as the technically capable heroes, whose "ingenious" engineers construct a fleet of well-armed airships that enable them to defeat the Martian "invasion" and promote world and interplanetary peace.[118] Hanstein, reflecting perhaps an appreciation for actual Japanese contributions to and influence in Weimar Germany's scientific development,[119] describes the Japanese as technically literate and advanced. In Mond-Rak these people are admirably represented by a journalist, Nagao Hazumi, who is shown to have a sincere professional and personal interest in technological development, especially the rocket research and moon flight of engineer Egon Helmstätter.[120]

Hans Dominik, moreover, writing under the influence of the post-1935 Nazi period, is sympathetic to both the Americans and Japanese, as well as the Italians. His appreciation, presumably, for America's financial and scholarly contributions to German scientific research is made manifest in Treibstoff as Americans are presented in a positive light. Here the fictitious Dr. Hegemüller definitely speaks highly of the American attempt to rocket to the moon, and expresses true regrets at the loss of astronaut Dr. Lee during his unsuccessful attempt to re-enter the earth's atmosphere. His respect for the Japanese and Italians also becomes evident in Treibstoff as they are portrayed as technically able and highly co-operative. This positive image of the

Japanese is illustrated in the character of Dr. Hidetawa. He realizes that the fuel or Treibstoff mixture is unstable and explosive yet heroically tries to inform Dr. Hegemüller. The theme of co-operative friendship among Germans, Japanese, and Italians is also given new emphasis when the German and Japanese scientists, in reply to an "SOS" from the Italian astronauts Billiari and Ruggero, quickly rocket to their rescue in a German spacecraft.[121] Both Gail and Daumann, furthermore, portray the Americans as wealthy and generous.[122] In Hans Hardt's Flight, Gail's character Hans Hardt is shown to be test flying his rocketship between Friedrichshafen and Detroit, in search of financial benefactors in the American business world for his rocket research. In Protruberanzen, Daumann's[123] heroes, Drs. Bracke and Hegar, also look to America, specifically to General Electric, for financial support of their solar energy research.[124]

Motives, moreover, for international friendship in the modern German novels were no longer the simple military-political bonds praised by Plato. Nor did religious sympathies provide grounds for a unity of cause (Andreae). Here actual, modern reasons were presented, as complex combinations of (1) military and scientific, (2) financial and scientific, as well as (3) purely scholarly or scientific needs provided the bases for fictitious alliances.

Motivated by an appreciation for the American engineers and their scientific ingenuity in mastering the Martian art of constructing spaceships, the German scientists in Two Planets ally with Americans[125] in order to defeat the Martian conquerors. In Hans Hardt's Flight, a combination of financial and scientific motives prompt the German-

American friendship. In the hopes of obtaining money from the Americans for his rocket work, engineer Hardt flies to America, where an American newspaper does set up a trust fund for his research work, and his anticipated flight to the moon.[126] The characteristic need to obtain the scientific expertise of a particular foreign scientist, later so clear in Albert Einstein's career, already appears in this German science fiction. In The Shot into Infinity, Gail's engineer Korf cultivates the friendship and scientific advice of the fictitious American astronomer, Dr. Nielson, an authority on Mars at the Lick Observatory in California, to aid his flight to the moon. In Treibstoff, Dominik's German engineers, Hegemüller and Grabbe, want the information of the Japanese Dr. Hidetawa, who has discovered the correct amount of fuel to use in the rocket, and also solved engineering and design problems about the rocket turbine. Italians, like Drs. Billiari and Ruggero (who have learned to control spaceship speeds),[127] are also consulted.

The Theme of Continuity

In the tradition of the earlier utopias, the modern German science fiction conveyed, through the fictitious characters, desires for peace and international harmony. Opposed to war,[128] the human and Martian heroes of Two Planets display peaceful intentions in their international and interplanetary behaviour. Although the Martians are shown to be imperialistic,[129] the altruistic intent of Friedrich Ell's initial contact with humanity is clearly to prepare the people of earth for the later arrival of more Martians. The Martians earnestly want earth ultimately to benefit from their technological and cultural blessings. Their actual landing on earth, at the Pole, indeed means peace, for the Martian Central Council wants simply to conduct peaceful economic and cultural exchanges. In an effort to bring to earth only "the benefits of [their] culture," in exchange for reasonable amounts of earth's natural resources, minerals, and water, the Martians seek contact:

> Since winter is approaching this North Pole, interrupting our traffic, the Central Council of Nu has decided not to wait for the arrival of the spaceships but to establish communication immediately with the citizens of earth. We believe that it is of immense importance that the two planets--the only ones in the entire solar system akin to each other in the kind of their inhabitants and in their cultures--further their material and intellectual life by mutual understanding.[130]

The human heroes of Gail's works share these hopes for international peace and understanding. In Hans Hardt's Flight, we see that Hans Hardt believes the development of solar energy means that "mankind will be unaffected by diminishing resources and will have no further need to take up arms." In The Shot into Infinity, engineer Korf thinks that his space station and solar reflector will mean an end to wars of aggression. Man can one day "be made independent of the decreasing coal supply of the earth, and any preparation for war can be nipped in the bud. Wealth and happiness shall come to the earth and let a joyful human race develop in unity and freedom." In Der Stein vom Mond, moreover, Korf realizes that his rocket and solar research could be used to prevent war -- "jeden Krieg im Keime ersticken." He is equally aware that his work could be employed to destroy the world. For peace-keeping reasons, therefore, he conducts his initial work in private, revealing the true nature and intent of his research only after its completion.[131]

Dominik also reveals, both explicitly and implicitly, his opposition to war, and in this opposition even transcends the martial *Blut und Boden* mentality of Nazi Germany. Although he recognizes the realities of Germany's friendship with Japan and Italy, he avoids and reference to the Nazis' post-1935 imperialism. His failure to consider this period of German aggression can be looked upon as an indicator of his opposition to and transcendence of the military position of the contemporary regime. In *Treibstoff*, through the fictitious Dr. Hegemüller, he speculates instead on a new and peaceful world, where technology, Zeppelins, and spaceships are appreciated as means to promote peace, especially in the form of commercial travel and space exploration. The space exploration is envisaged as the search for new and habitable worlds offering "Lebensraum" for peaceful colonization,[132] rather than imperialistic exploitation.

This German science fiction, again in the tradition of its utopian predecessors, appeared to support mild forms of patriotism. But it never supported its debased form, virulent nationalism.[133] Instead, and like the earlier utopists, the German science fiction writers showed a marked preference for humanitarian ideals of brotherhood among all individuals or groups, regardless of race, creed, national, or planetary origin. Lasswitz clearly exhibits a German bias in *Two Planets*.[134] Yet he also reveals a demand for humanitarian behaviour among all peoples or "beings," in his fictitious Martians. In spite of their "alien" differences, engineers Fru and Jo and medical Dr. Hil respond to the plight of the earth scientists with food and medical assistance. The Martian sense of brotherly humanitarianism presents an absolute, abstract ideal to which all men of earth, including the Germans, must aspire. The Martians even implore earthlings to end wars caused by virulent nationalism and racism: "Germany, France or England--no nation or state is an end in itself. Only humanity as a whole can be an end in itself. The individual peoples and states are only means to fulfill the idea of humanity."[135]

Gail, too, displays a liberal sense of German pride.[136] He, nevertheless, hopes that mankind will transcend extreme nationalism in favour of humanity. These hopes become clear in The Shot into Infinity, as engineer Korf blames himself for allowing his nationalist feelings to cloud more important humanitarian issues. He

> felt responsible for the unfortunate person. One reproach gnawed at his conscience. Had it been right to refuse the foreign money, several times offered him, out of vain national pride? Did his ship really have to be merely German work throughout? Are not all nations alike before eternal infinity?[137]

He then swallows his nationalistic pride and accepts the financing of the Roumanian financier, Vacarescu. This he does in order to complete his spaceship and fly to the endangered Skyorna, knowing that "the enterprise has a noble humane purpose to fulfill." Gail also condemns most forms of nationalistically inspired racial prejudice. This is made most evident in Der Stein vom Mond, in the characters of engineer Korf and archeologist Burns.[138]

Dominik's Treibstoff is not devoid of Nazi German nationalist rhetoric.[139] Nonetheless, it, too, implies a rejection of cultural racism and military alliances, in favour of humanity. Here Dominik clearly reveals an opposition to the prevailing government's virulent anti-English and martial position, in his unwillingness to look upon Nazi Germany's political and military arch-enemy, the English, as antagonists.[140] The

German scientists' dependence on the advice of foreign or Italian and Japanese scientists, moreover, definitely contradicts Nazi allegations of German racial "superiority." The animosity expressed, sometimes, towards the Italians and Japanese,[141] allies of Germany, also suggests Dominik's disillusionment with and rejection of the Third Reich's actual military and diplomatic policies.

PART III

CONCLUSIONS

The "model" we have chosen to describe utopian thought has been applied to some examples of modern German science fiction. We have tried to show that these works follow in the technological utopian tradition of works by Plato, Andreae, and Wells. Bloch[142] argues that Lasswitz's works are merely Märchen, Lassmann[143] claims that Dominik's contributions are of no absolute value, while Segal[144] contends that science fiction, as a genre, does not represent technological utopianism. We must, nonetheless, conclude that the representative authors of science fiction chosen for this study were writers of genuine technological utopias.[145] These technological utopias, moreover, are of a literary variety and satisfy the parameters of the model proposed earlier, when dealing with the topics: (1) women, (2) scientific and political elites, (3) science, and (4) international politics.

To summarize the findings, we may reiterate the applicability of the model parameters of change and continuity. The theme of change between these modern German examples and the earlier works already examined was attributed to the "sociology of knowledge" assumed on the part of the authors. The German works mirrored views and attitudes and showed greater scientific sophistication and scientific priorities that were the unique products of the writers' social milieu. The theme of continuity or tradition was created when these authors, like their utopian predecessors, rejected contemporary negative ideology regarding the topics and, subsequently, transcended to a "revolutionary" ideal outlook. This outlook, moreover, revealed their desires for (1) social mobility, (2) responsible, humanitarian behaviour from the citizens and the elites, (3) social and scientific freedoms, (4) social and scientific progress, as well as (5) peace. It also, consequently, won them a place in Ernst Bloch's utopian tradition of freedom (Freiheit), as well as Karl Mannheim's utopian tradition of liberal-humanitarianism.

On the one hand, then, this literature demonstrated the theme of historical change. Women were characteristically offered a greater variety of social roles, which were also more intellectually demanding. Some negative attitudes persisted. Yet these were distinctly modern, viewing women as professional competitors. Members of the scientific and engineering community, reflecting each author's own scientific background and bias, were now the new heroes of society. Furthermore, they clearly represented modern-day specialists who were, professionally, both highly sophisticated and multi-talented. Although a certain naiveté about the potential villainy of technocrats permeated the works, the personal qualities of the scientists and engineers were, nevertheless, viewed as socially important. They alone possessed the heroic moral character necessary to set the moral tone and define the new technocratic outlook of society. The scientific and technological proposals, even if at times technically inaccurate, were nevertheless more realistic and sophisticated than those considered in the earlier utopian literature, due to the modern authors' scientific expertise. In international politics, political and scientific allies, as well as foes, were treated according to a specifically German appeal to a patriotic point of view.

The works also showed the theme of intellectual continuity. Women were consistently viewed positively. They were appreciated for their sentient nature, and accorded both equal educational opportunities as well as freedom and some job mobility. The technocratic elite was trusted to behave in a socially and scientifically responsible and humanitarian manner, no less than Plato's civil engineers, Andreae's scientists, or Wells's Samurai. Freedom to conduct scientific research and seek truth was important in this science fiction. The authors, moreover, in spite of their expertise, remained, at times, naive about the potential misuse or detrimental affects of the new science.[146] Technology was consistently looked upon as a positive means to create a better world. It was expected to be used only for responsible, humanitarian, non-political, and non-military purposes. No less than their utopian predecessors, these German authors envisaged scientific progress as marching hand-in-hand with social, cultural, and moral progress. In the arena of international politics, the modern writers, no less than Plato, Andreae, and Wells, sought and advocated peace and humanitarianism. Their desire for international harmony was opposed to the realities of war and international discord.

The new society envisaged in this German science fiction, then, no less than that of Atlantis, Christianopolis, or Wells's Federations, offered social and scientific freedoms and demanded responsible, liberal-humanitarian behaviour of its citizens. In addition, speculative optimism and a desire for continued social and scientific progress were very much part of the spirit of the technological utopia. Above all, these modern German science fiction works or technological utopias viewed science and technology as means of promoting greater social and international understanding. Indeed, and contrary to Segal,[147] a scientifically and technologically-orientated society, led by an elite of "priestly" scientists and engineers, was clearly the futuristic goal of this German science fiction.

FOOTNOTES

CHAPTER THREE

[1] See David S. Landes, *The Unbound Prometheus. Technological Change and Industrial Development in Western Europe from 1750 to the Present* (Cambridge: The University Press, 1969), esp. pp. 124-358; and Reginald Phelps and Jack Stein, comps. and eds., with the collaboration of I. B. Cohen, *The German Scientific Heritage* (New York: Holt, Rinehart and Winston, 1962), pp. 167 ff.

[2] Willi Ley, *Rockets, Missiles and Men in Space* (New York: The Viking Press, 1968). The Treaty of Versailles limited German military aircraft production, but disregarded rocketry.

[3] Paul Forman, "The Environment and Practice of Atomic Physics in Weimar, Germany: A Study in the History of Science" (Ph.D. dissertation, University of California, Berkeley, 1967), pp. 1-6, 25-35, 206 ff. Forman has produced an excellent and informative thesis. The section on scientific funding is particularly enlightening, revealing not only the reasons for the financial survival of German scientific academics and their research, but also explaining, by implication, the motives for good scientific and political relations amongst Germans, Americans, and Japanese. This last point is significantly relevant to the German science fiction, and will be dealt with on appropriate occasions in the course of this chapter.

[4] Max Valier, Guido von Pirquet, Walter Hohmann, and Max Planck were but some of the foremost Germans in the field of atomic physics and rocketry. Walter Hohmann's *Die Erreichbarkeit der Himmelskörper* is another seminal German contribution from this era, to the theory of space flight. See Otto Gail, *Physik der Weltraumfahrt* (München: Hanns Reich Verlag, 1948), esp. pp. 112 ff.; Ley, *Rockets*; and Hermann Oberth, *Man into Space. New Projects for Rocket and Space Travel*, trans. G. P. H. de Freville (London: Weidenfeld and Nicolson, 1957), and *Wege zur Raumschiffahrt* (München: Verlag von R. Oldenbourg, 1929), a revised edition of his famous *Die Rakete zu den Planetenräumen* (1923).

[5] Haber quoted in Forman's preface, pp. ii-iii.

[6] E. M. J. Kretzmann, "German Technological Utopias of the Pre-War Period," *Annals of Science* 3, no. 4 (1958): 417. A further indication of the literary enthusiasm for scientific and technological development, and of the often close relationship between German scientists and German science fiction writers, is revealed in the dedication to Fritz Lang and Thea von Harbou by Oberth in his *Wege zur Raumschiffahrt*. Harbou was a well-known science fiction writer of the Weimar era whose two major works, *Metropolis* and *Frau im Mond*,

were made into motion pictures by producer-director Fritz Lang. The model rocket used in the second film was based on Oberth's "Model B" design (see Ley, *Rockets*, pp. 114-21, and plates II, III, and IV).

[7] Refer to chapter 1 for definitions.

[8] Martian Schwonke, *Vom Staatsroman zur Science Fiction. Eine Untersuchung über Geschichte und Funktion der naturwissenschaftlich-technischen Utopie* (Stuttgart: Ferdinand Enke Verlag, 1957), pp. 45, 161. Pierre Versins also points to the popularity of Gail and his works in *Encyclopédie de L'Utopie, des Voyages extraordinaires et de la Science Fiction* (Lausanne: Éditions L'Age d'Homme S.A., 1972), p. 354.

[9] Hans-Jürgen Krysmanski, *Die utopische Methode. Eine literatur- und wissenssoziologische Untersuchung deutscher utopischer Romane des 20. Jahrhunderts*, Dortmunder Schriften zur Sozialforschung, Band 21 (Köln: Westdeutscher Verlag, 1963), p. 85. Gaar and Tuck also claim that Dominik was an important contributor to the science fiction genre. See Alice C. Gaar "German Science Fiction: Variations on the Theme of Survival in the Space-Time Continuum" (Ph.D. dissertation, Chapel Hill, 1973), pp. 14-15; and Donald H. Tuck, comp., *The Encyclopedia of Science Fiction and Fantasy. A Bibliographic Survey of the Fields of Science Fiction, Fantasy and Weird Fiction through 1968*, vol. 1: *Who's Who, A-L* (Chicago, Advent Publishers Inc., 1974), p. 146.

[10] Walter Hirsch, "The Image of the Scientist in Science Fiction: A Content Analysis," *The American Journal of Sociology* 63 (1957-58): 508.

[11] Including Krysmanski, pp. 90-91.

[12] Hans Lindau, introduction to *Empfundenes und Erkanntes. Aus dem Nachlasse*, by Kurd Lasswitz (Leipzig: Verlag von B. Elischer Nachfolger, 1919), pp. 5-34. More information on the life and works of Lasswitz is available in Tuck, p. 265, Gaar, p. 13, and Ley, *Rockets*, p. 42.

[13] Including *Die Geschichte der Atomistic vom Mittelalter bis Newton (1874-1889)*, mentioned in Lindau's introduction to Lasswitz's *Empfundenes*, p. 14.

[14] His *Seifenblasen*, consisting of a collection of modern *Märchen* including "Der Schirm" (1893) and "Der Traumfabrikant" (1886), reveals the literary quality of his thought. *Empfundenes*, comprised of a collection of his poetry, scholarly scientific essays, and speculative contributions on the nature of aliens and other worlds, shows the poetic nature of his mentality as well as the depth and sophistication of his scientific intellect. *Seifenblasen. Moderne Märchen* (Leipzig: Verlag von B. Elischer Nachfolger, n.d.).

[15] Kurd Lasswitz, Two Planets, abridged by Erich Lasswitz, trans. Hans H. Rudnick, afterword by Mark R. Hillegas (Carbondale: Southern Illinois University Press, 1971). Originally published as Auf Zwei Planeten, Roman in Zwei Buchern (Leipzig: Verlag B. Elischer Nachfolger, 1897). For the purposes of this study, the abridged English version was used. According to Versins (p. 515), this is a reputable edition, retaining most of the important details contained in the original. The use, therefore, of the later version will not affect the quality or meaning of the arguments expressed within this essay that pertain to the work or the mentality of the author. Brief, although decent résumés of this work abound. See, in particular, Versins, pp. 514-15 and Ley, Rockets, pp. 42-45.

[16] According to Ley, Rockets, p. 42 and pp. 44-45.

[17] During World War Two, von Braun, for instance, worked with the Nazis on their rocket projects at Peenemünde. He later went to the United States to work at NASA. See the postscript to Lasswitz's Two Planets by Hillegas, p. 397.

[18] Information from Gail's Physik.

[19] Hans-Joachim Flechtner, "Die phantastische Literatur. Eine literarische Untersuchung," Zeitschrift für Aesthetik und Allgemeine Kunstwissenschaft 24 (1930): 43. Gail acknowledged the assistance of Oberth and Oberth's work Wege zur Raumschiffahrt, in the writing of his own scientific text Physik.

[20] His many scholarly works, including: Physik; Mit Raketenkraft in Weltenall. Vom Feuerwagon zum Raumschiff, vorwort Max Valier (Stuttgart: K. Thienemanns Verlag, 1928); and the juvenile Romping Through Physics, trans. H. S. Hatfield (London: George Routledge and Sons, Ltd., 1933), were translated into almost all European languages.

[21] Otto Gail, By Rocket to the Moon. The Story of Hans Hardt's Miraculous Flight, trans. name not provided (New York: Sears Publishing Co., Inc., 1931); The Shot into Infinity, trans. F. Currier, Science Wonder Quarterly, Fall, 1929; reprint ed., The Garland Library of Science Fiction (New York: Garland Publishing Inc., 1975); Der Stein vom Mond, Kosmischer Roman (Breslau: Bergstadt Verlag, 1926).

[22] Hans Hardt's Flight, for instance, was translated into half a dozen foreign languages (Schwonke, p. 161). For more information regarding the popularity of and for résumés on these works, refer to Versins, p. 354 and Tuck, p. 178.

[23] Gail's introduction to his The Shot, p. 7.

[24] Gaar, pp. 14-15. Also see Flechtner, p. 43 and Schwonke, p. 53.

[25] Including Triomph der Technik, Bongs Jugendbücherei (Berlin: Verlag von Rich. Bong, 1928).

[26] Hans Dominik, Treibstoff SR (Berlin: Verlag Scherl, 1940). Other works by him include Atlantis and Die Macht der Drei. Refer to Versins (p. 257) for a list of his numerous contributions to science fiction, and for a brief summary of Treibstoff.

[27] Kurd Lasswitz wrote a number of other science fiction essays, some of which mix science fiction with satire and fantasy. They all, nevertheless, contribute to one's understanding of his views on women, scientific and political elites, scientific and technological development, and international relations. These works include: "Aladdin's Lamp" (1888), trans. Willy Ley, The Magazine of Fantasy and Science Fiction, May 1953, pp. 92-99; "Bis zum Nullpunkt des Seins. Erzählung aus dem Jahre 2371," in Bilder aus der Zukunft. Zwei Erzählungen aus dem vierundzwanzigsten und neununddreißigsten Jahrhundert (Breslau: S. Schottlaender Verlag, 1878), pp. 1-88; "Gegen das Weltgesetz. Erzählung aus dem Jahre 3877," in Bilder, pp. 1-170; "Psychotomy" (1885), trans. Willy Ley, The Magazine of Fantasy and Science Fiction, July 1955, pp. 102-10; "Auf der Seifenblase" (1887), in Seifenblasen, pp. 5-22; "Der tote und der lebendige Mars," in Empfundenes, pp. 175-85; "Unser Recht auf Bewohner anderer Welten" (1910), in Empfundenes, pp. 163-74; "When the Devil took the Professor" (1895), trans Willy Ley, The Magazine of Fantasy and Science Fiction, January 1953, pp. 52-62; "Das Wunder des Zeppelin" (1909), in Empfundenes, pp. 271-77. Also, Emil Sandt, Cavete! Eine Geschichte, Über deren Bizarrerien man nicht ihre Drohungen vergessen soll, vierte Aufl. (Minden i. Westf.: J. Bruns Verlag, 1906); and Das Trio: Religion-Moral-Technik-und Gott (Braunschweig: Hellmuth Wollermann Verlagsbuchhandlung, 1931); Otto Schultzky, Im Saturnsystem, 1: Die Monde Rhea und Titan; 2: Auf Saturn (Mainz: n.p., 1919). Thea von Harbou, the only female author represented here, was the wife of the German film director Fritz Lang (see Versins, pp. 407-408, for more information on Harbou and for brief summaries of her works). Her two important science fiction works, Metropolis and The Rocket to the Moon, are of particular significance for three reasons. First, they present a woman's vision of the new technologically-orientated society with its new social groups and values. Second, Metropolis is a rare example of a German dystopia, reflecting Harbou's fears of the threat of technology to mankind and his humanism. Third, both are valuable because each formed the basis of the first two well-known science fiction films ever produced, significantly German UFA productions by Fritz Lang (see footnote 6 above). Metropolis, A Novel, trans. name not provided (London: The Readers Library Publishing Co., Ltd., n.d.); The Rocket to the Moon, based on the UFA Production by Fritz Lang of Harbou's The Girl in the Moon, trans.

Baroness von Hutten (New York: World Wide Publishing Co., Inc., 1930). As well, Otfrid von Hanstein, Mond-Rak I: Eine Fahrt ins Weltall, Ein Zukunftsroman (Stuttgart: Levy und Muller Verlag, 1929); Part 1 of "Utopia Island," trans. Francis Currier, Wonder Stories. The Magazine of Prophetic Fiction 2, no. 12, May 1931, pp. 1352-97 and p. 1417; Part II of "Utopia Island," trans. Francis Currier, Wonder Stories. The Magazine of Prophetic Fiction 3, no. 1, June 1931, pp. 76-128; Walter von Heichen, Jenseits der Stratosphäre. Erlebnisse zwischen Mond und Erde. Eine Erzählung für die Jugend (Berlin: A. Weichert Verlag, 1931). Daumann, while not as popular as Dominik (Schwonke, p. 162), also wrote a number of science fiction works. These, too, represent the Nazis' aggressive (post-1935) period and include: Dünn wie eine Eierschale, Roman (Berlin: Schützen Verlag, GmbH., 1937); Die Insel der 1000 Wunder: Ein utopischer Roman (Berlin: Schützen-Verlag, GmbH., 1940); and Protruberanzen: Ein utopischer Roman (Berlin: Schützen-Verlag, GmbH., 1940).

[28] That is, the reality of women functioning as scientists, the quality of Marie Curie, or working in business as clerks, typists, and secretaries (Angestellte), or serving in factories during war-time.

[29] The Martian women in Lasswitz's Two Planets, p. 222.

[30] Like Isabella in Gail's Der Stein, p. 80 or Ethelrid in Daumann's Protruberanzen, pp. 190, 265-68.

[31] The Martians, La and Se, are technical and medical assistants to Dr. Hil in Lasswitz Two Planets (pp. 22, 67-68), Friede represents a film technician in Harbou's The Rocket (pp. 140, 158), while Irene plays a mathematician and science scholar, as well as a rocket technician, in Hanstein's Mond-Rak (pp. 75, 151, 190-92).

[32] For example, Lyrika, an hydraulics engineer in Lasswitz's "Gegen das Weltgesetz" (p. 118) and Natalka, a design engineer and astronaut in Gail's The Shot (pp. 68-69, 71-72).

[33] Lasswitz, "Gegen das Weltgesetz," pp. 118, 128.

[34] Gail, The Shot, pp. 9, 68-69, 72.

[35] One could cite numerous examples illustrating a literary tradition of negative images of women. Studies on utopias and other literature by Barbara Kaplan in "Women and Sexuality in Utopian Literature" (Ph.D. dissertation, New York University, 1977) and Marylin Arthur in "'Liberated' Women: The Classical Era," in Becoming Visible: Women in European History, eds. Renate Bridenthal and Claudia Koonz (Boston: Houghton Mifflin Co., 1977), also demonstrate that women have consistently been: relegated to inferior positions, limited in the number of job opportunities open to them, restricted with regard to the quality of their work, patronized, and viewed as emotional by nature, or limited in intellect and ability. However, while studies

have looked at the consistency of these negative images in social literature and social utopias, none has examined the continuation of this tradition into modern German science fiction. But, as argued above, modern German science fiction continues to present, in this "utopian tradition," negative views of women. The unique approach of our study will focus on "how" and "why" the negative images have changed from early to modern times, and on "how" the "sociology of knowledge" of these writers has influenced their bias.

[36] Gail's Hans Hardt's Flight panders to male juveniles. Its introduction is directed at young men destined to become the engineers who create the first rocketships (p. vi). No female characters are depicted. In Dominik's Treibstoff, the scientific and leading characters are again male, while in Daumann's Die Insel, the heroes are male scientists and two boys, Thede Born and Etsche Preyer (pp. 7-23).

[37] Lasswitz, Two Planets. The male dominance is also evident in other works by Lasswitz, including: "Seifenblase," "When the Devil took the Professor," and "Aladdin's Lamp." This tradition continues in Sandt's Cavete, Harbou's The Rocket and Metropolis, and Hanstein's Mond-Rak.

[38] Dominik's Treibstoff and Daumann's Protruberanzen describe no female characters or heroines.

[39] This was done, obviously, to avoid any social competition with men in the new society.

[40] This unwillingness to allow female characters independence of thought and action is seen as well in Sandt's Cavete, pp. 21-23, 95.

[41] Gail, Der Stein, p. 80

[42] Harbou, The Rocket, p. 98. Such restrictions on a woman using her full intellectual and technical potential are found again in Hanstein's Mond-Rak, where Irene, fully capable as a rocketry technician, plays the role of Walderman Apel's "assistant" on the second space flight (pp. 75, 151, 190-92).

[43] Daumann, Protruberanzen, pp. 19-27, esp. 26-27.

[44] Sandt, Cavete, pp. 20-21.

[45] Gail, The Shot, p. 71.

[46] Barbara Kaplan's excellent study examines the role of sexuality in utopian thought. She argues that far from being a minor concern, "sexuality is at the heart of utopia" and "it is the thesis of this study that an examination of the role of sexuality within utopian fiction allows us to get at the heart of each utopia ...." (pp. 2, 8). Although, as she points out, women were often viewed as equals of men, responsible by nature and demanding respect (p. 13), the same authors also projected a "distrust" of or "hostility" towards women (pp. 15-16). They saw women as sex-objects, weak, irrational, even base and evil. Kaplan does not examine this tradition in science fiction. Yet this "utopian" dichotomy is evident, as will be demonstrated, in our modern German science fiction as well.

[47] Lasswitz, *Two Planets*, pp. 22, 67-68, 222; Gail, *Der Stein*, p. 80; Hanstein, *Mond-Rak*, pp. 75, 151; and Daumann, *Protruberanzen*, pp. 190 ff. and 265-68. Brigitte, the bright young niece of the Oberpräsident in Sandt's *Cavete*, patronized in spite of her intelligence, is given an education in music, science, mathematics, and the arts equal to that of her cousin Ferdinand (pp. 151-53).

[48] Lasswitz, "Gegen das Weltgesetz," pp. 118, 128. Gail, *The Shot*, pp. 67-69. Hanstein's Irene is offered the occasional opportunity to function usefully in the role for which she is qualified --research scientist and rocketry technician (*Mond-Rak*, pp. 75, 151, 190-92). Harbou's Friede is also able to fulfil her potential outside the home, in the role of a photographic specialist (*The Rocket*, pp. 140, 158).

[49] All these modern German science fiction writers were scientists or technicians in their own right (see Part I). Moreover, Hortleder's fascinating work *Das Gesellschaftsbild des Ingenieurs. Zum politischen Verhalten der technischen Intelligenz in Deutschland* (Frankfurt-am-Main: Suhrkamp Verlag, 1970), deals with the relationship of the German scientist, in particular the German engineer, to politics, the State, and his work since 1850. The study looks at the phenomenal growth and influence of this new class in Germany (p. 8), and points to the fact that this potentially powerful elite had its own societies, the *Verband deutscher Ingenieure* (VDI) and, since 1893, the *Verband deutscher Eleckrotechniker (VDE)*, as well as its own publications, including the *VDI Nachtrichten* (p. 9). The VDI, well-established prior to the Imperial period of William II, and with a membership of 21,800 in 1908 (pp. 49, 69), was a major force in the post-1850 consolidation of power of this new social cadre of engineers (pp. 18-19). Forman also looks at the growing influence of the scientific community in Weimar Germany, and focuses on its ability to obtain the financial support of major German companies, like Siemens (pp. 206 ff). Ley, too, in his *Rockets*, emphasizes the growing power of the new engineering community and examines the influence of men like Oberth and Walter Hohmann (pp. 88, 100 ff). Indeed, he focuses on the growing social and scientific interest in the astronautical engineer and space travel as he notes the formation of the professional *Verein für Raumschiffahrt*

(The Society for Space Travel), which boasted members like Oberth, Johannes Winckler and Hohmann, and which published its own Die Rakete (1929) (pp. 88 ff., esp. 117 ff.).

[50] In Two Planets, by Lasswitz, Martian medical doctor Hil, engineers Fru and Jo, and research scientists Ra and Ell, as well as "earthmen" research scientists Hugo Torm, Grunthe, and Joseph Saltner, play the heroic roles. Engineers August Korf, Natalka Suchinow, and Hans Berger, medical doctors Samuel Finkle and Bell, astronomer Nielson, and archeologists Dr. Alexander Hardt and William Burns represent the leading characters in Gail's The Shot, Der Stein, and Hans Hardt's Flight. Engineers Grabbe, Hegemüller, Enrico Tomasea, Carlo Billiari, engineering technicians Natahira and Saraku, and research scientists Drs. Thiessen, Ludinghausen, Ruggero, and Hidetawa, moreover, act as the heroes in Dominik's Treibstoff. Again, in Lasswitz's "Gegen das Weltgesetz," "Seifenblase," "When the Devil took the Professor," and "Aladdin's Lamp," as well as Sandt's Cavete, Harbou's Metropolis and The Rocket, Hanstein's Mond-Rak, and Daumann's Protruberanzen and Die Insel, the heroes and heroines are consistently scientists and engineers.

[51] Raymond Ruyer considers the society of science fiction as the "Paradies der Ingenieur" [Ruyer quoted in Viktor Suchy's "Zukunftsvisionen des 20. Jahrhunderts. Der utopische Roman der Gegenwart als Diagnose der Zeit," Wissenschaft und Weltbild 5 (1952): 19]. Margot Kadinsky in "Über Science Fiction," der Anhang zu Der Mythos der Maschine. Aus der Praxis analytischer Psychotherapie, by David Kadinsky (Bern: Hans Huber Verlag, 1969), notes that the hero in most science fiction is a scientist--whether archeologist or engineer (pp. 224-26). Segal, in his examination of American technological utopian thought including Bellamy's Looking Backward and European examples like Andreae's Christianopolis and F. Bacon's New Atlantis, recognizes the importance of the scientist and engineer in the technological society. He insists, however, that there is no relation between modern science fiction and technological utopianism (pp. 1-2). The heroic importance of the scientist and engineer in both modern science fiction and technological utopian thought, nevertheless, suggests a connection and one that is not remote. Howard Segal, "Technological Utopianism and American Culture, 1830-1940" (Ph.D. dissertation, Princeton University, 1975).

[52] Lasswitz, Two Planets, pp. 2-4, 21-26, 134; Gail, The Shot, pp. 9, 10, 13, 42, 75; Der Stein, pp. 10, 20, 69, 71, 76, 120, 128, 267; Hans Hardt's Flight, pp. 39-44; and Dominik Treibstoff, pp. 3, 20, 76. This clear representation of scientific specialists is also found in Lasswitz's "Gegen das Weltgesetz" (pp. 118, 128) and "Seifenblase" (pp. 6-7), which emphasize the importance of hydraulics engineers and research inorganic chemists. Sandt's Cavete, Harbou's Rocket (pp. 11, 17), Hanstein's Mond-Rak (pp. 14-16, 75, 151, 190-192, 213) and "Utopia Island," Part I (pp. 1384-85), and Daumann's Protruberanzen (pp. 7-19, esp. p. 9) and Die Insel (pp. 48, 51-59, 64, 79, 95), also focus on specialists like aeronautical engineers, astronautical

engineers, film technicians, mathematicians, medical doctors, astronomers, and physicists.

[53] Hirsch, in his examination of American science fiction, also notes the highly complex nature of the scientists portrayed. The scientists occupational setting is, he claims, no longer that of the independent "gentleman scientist" but one highly "bureaucratized" with institutional, financial, and business pressures (p. 510).

[54] Sandt, Cavete, pp. 18-19; Lasswitz, Two Planets, pp. 2-4, 134, 270; Gail, Der Stein, p. 87; The Shot, pp. 10, 29, 35, 42, 77; and Daumann, Die Insel, pp. 48-64, 79, 95. Gail's two works show how complicated the scientist and his life has become. In both, the scientist is found to be dependent on government and private investors (the oil magnate Vacarescu in The Shot, pp. 9, 29, 35) to conduct his scientific work, and in need of a business sense in order to financially ensure the success of his scientific endeavours. Gail's Hans Hardt's Flight also characterizes the complex bureaucratized engineer-businessman.

[55] Hortleder, for instance, points to the discontent voiced by the engineers to the Weimar Republic. A statement in the VDI-Vorsitzenden Köttgen (1931) characterized their dissatisfaction with the Weimar government, politicians, and society in general:

> "wir sind es müde, bloB noch zu zergliedern, die Sehnsucht nach der groBen Zusammenfassung geht durch unser ganges Volk. Wir wollen wieder lieben, wir wollen glauben, wir wollen uns nicht jedes starke Empfinden schon vor dem Entstehen und der Entwicklung durch die sich stolz auf diese Grundlichkeit herufende zersetzende Kritik vernichten lassen" (p. 107).

[56] In his examination of American science fiction, Hirsch focuses on the constant anti-political and anti-capitalist themes. He notes that the natural scientist is portrayed as the hero, who sets the moral standards and is, by right, the "legitimate" elite. Politicians, on the other hand, are characterized as villains, while "evidently the businessman is the bête noire of science fiction" (p. 509).

[57] Sandt, Cavete, pp. 127, ff., 157-64, 172 ff., 192, 194-95, 208 ff., 217-27, 232-33. Sandt's work is a rich text, overflowing with social and political comment. The absence of any information on Sandt himself forced the exclusion of his work as a major text for examination.

[58] This incident, of course, reflects the actual conflicts between workers and the Imperial and later Weimar governments and capitalists. It also mirrors both the real attempts by politicians of the Right to crush the workers with the aid of the military, as

well as the Imperial and Nazi governments' hopes to destroy the political influence of the working class by outlawing its Social Democratic and Spartacus or Communist parties.

[59] Gail, The Shot, pp. 14-15. The reason Korf is obliged to turn to the people for finances is, as Councillor Heyse informs him, the "reconstruction, cutting down expenses, government economy, the peace treaty ...." The government, Heyse continues, will be unable to support him and investors will be unwilling to contribute to a risky venture like rocketry in such economically and politically uncertain times (p. 14). This quotation is significant in that it reveals the influence of the author's "sociology of knowledge" on his literary works. Indeed, while little was said in American science fiction about the Depression, the financial difficulties, or unemployment, remaining instead purely escapist literature (Hirsch, p. 510), the German science fiction of the same period reflected such problems. This quotation is of further significance in its unjustified antagonism towards the Weimar government. It ostensibly and bitterly suggests, in its critique of the fictional government, that the Weimar government was not generous in its support of scientific endeavours. Both Forman and Ley, however (see the introduction to this chapter), point to the financial generosity of both the Reich and the Länder to scientific research. In fact, Ley points out that the government encouraged rocketry research and development because "The Treaty" said nothing about this area of scientific work. Gail's implied critique of the actual parliament was, therefore, not warranted, and is inexplicable in any terms other than as a means to convey a scientist's antagonism to politicians.

[60] Gail, The Shot, p. 9. This incident perhaps reveals Gail's bitter awareness of the actual dependence of impoverished Weimar researchers and scientists on foreign investors or corporations, like General Electric, for financial aid and research grants (see Forman, pp. 206 ff.).

[61] Daumann, Protruberanzen, pp. 241-58 and 275-84. Such anti-business and anti-government sentiments are conveyed also in Harbou's The Rocket, pp. 31, 39, 47-51, 67, 73, and Hanstein's Mond-Rak.

[62] Forman's study examines the highly politicized nature and behaviour of the German scientific community in Weimar. In universities, for instance, students and professors alike voiced a variety of political views, from conservative to liberal to socialist. Many were militaristic, anti-democratic and anti-Semitic in outlook. Physicists, in particular, were notoriously and radically right-wing (pp. 40-56). Their Deutsche physikalische Gesellschaft (DPG) expressed highly nationalistic notions of pan-Germanism and German science in its politically aligned journals or Zeitschriften (pp. 142-83). The politicization of scientists, like von Braun, was also evident in the Nazi period, and like earlier times, often resulted in an abuse of

technology. Evidence of abuse was seen in the use of poisonous gas for military purposes during World War One, in the official or covert use of weaponry (guns) by the Weimar and Nazi governments, to eradicate the political opposition (Socialists and Communists), and in the alliance between big business (Farben factories and its scientists) and the Nazi government, to create the tools needed to conduct the government's war and other abusive policies against particular professional or other groups (intellectuals, Jews, or other nations).

[63] Hortleder considers Albert Speer (an architect) to have been "der Prototyp des 'unpolitischen' Technokraten" (p. 121). Highly politicized and irresponsible, however, might have been better adjectives to describe him. In contrast to the likes of Speer, whose architecture was aimed at glorifying a select Nazi elite, in particular one man, the fictional elite being examined in this study, while a-or unpolitical, is nonetheless responsible.

[64] Lasswitz, Two Planets, p. 24; Hanstein, "Utopia Island," Part I, pp. 1384-85.

[65] Sandt, Cavete, pp. 127 ff., 157-64, 172 ff., 192 ff., 194-95, 208 ff., 217-27, 232-33.

[66] Hanstein, Mond-Rak, pp. 50-51, 213.

[67] Gail, Der Stein, pp. 91, 119. The responsible humanistic qualities of engineer Korf were very likely modelled after those of Germany's "Father of Rocketry," Hermann Oberth, who anticipated the progressive and beneficial uses of rocketry research, and with whose ideas and nature Otto Gail was well acquainted.

[68] Dominik, Treibstoff, pp. 76, 95, 129. This desire to share scientific accomplishments and knowledge with all mankind, and to prevent their exploitation by an unscrupulous political or commercial elite is evident as well in Harbou's The Rocket, pp. 31, 39-47, 50-52, 73, and Daumann's Die Insel, pp. 59-64.

[69] The age of the engineer, or the era pervaded by an engineering and scientific ideology and actually dominated by technocrats, arrived in Germany after 1945. Hortleder (pp. 139-40) suggests that the move towards the engineers' complete integration into German society began during the Nazi period, with its expression of a Gemeinschaftsideologie. With their final social integration and the resultant expression of their ideology, appeared works of science fiction (such as those in the Perry Rhodan series) that, in contrast to the pre-1945 literature, voice the ideology of the engineer and astronaut rather than present the technological utopian vision of what was a pre-1945 utopian elite.

[70] Types, that is, such as aristocrats or, in the pre-1914 era, the old bourgeoisie or business class, as represented by the father in Thomas Mann's *Tonio Kröger*.

[71] Hortleder, pp. 83, 107, 114, 132.

[72] Forman, pp. 11, 15.

[73] Lasswitz, *Two Planets*, pp. 39-40, 127, 176. Willy Ley praises the realistic nature of Lasswitz's notions on the use of rocket propulsion as a means to overcome wind friction and gravity, and, thereby, ensure both the actual flight and speed control of an air or space vehicle. Indeed, one of the first German rockets tested was called "Repulsor 1" after Lasswitz's airship *Repulsit* (*Rockets*, pp. 136-39).

[74] Gail, *Physik*, pp. 100-11. The design of Hardt's spaceship is accurately based on the "Model B" proposed by Oberth. The overall design of Egon Helmstätter's rocketship (Hanstein, *Mond-Rak*, pp. 14-15) and that of Wolf Helius (Harbou, *The Rocket*, introduction) also imitates this prototype.

[75] Gail, *Hans Hardt's Flight*, pp. v-viii, 26-38, 40, 79-92, 125-35, 219-29. This mixture of alcohol, oxygen, and hydrogen approaches the consistency and proportions of fuel proposed by Oberth for rocket travel. Korf's ship, like that of Hardt's vessel, consists of two complex propulsion rockets, the first auxiliary rocket uses alcohol for combustion, the second runs on the burning of alcohol and hydrogen (*The Shot*, pp. 7, 9, 24, 31, 40). In *Physik* (pp. 100-11), Gail himself elaborates on the feasible nature of Hardt's space trip. He notes that such problems as the use of correct fuel to maintain speed must be overcome if space flight is to be realized. Guido von Pirquet, a German engineer and contemporary of Gail, compliments Gail's detailed approach to the nature of space travel, and appreciates especially his realistic speculations on the need for adequate fuel and tremendous thrust to maintain speeds and orbits of rocketships. Pirquet, "Die ungangbaren Wege zur Realisierung der Weltraumschiffahrt," in *Die Möglichkeit der Weltraumfahrt. Allgemeinverständliche Beiträge zum Raumschiffahrtsproblem*, hrsg. Willy Ley (Leipzig: Verlag von Hachmeister und Thal, 1928), pp. 284-323. As a point of interest, an alcohol-hydrogen fuel mixture was used in the U.S. manned spacecraft series "Gemini." See Reginald Turnill's *The Observer's Book of Manned Spaceflight* (London: Frederick Warne and Co. Ltd., 1975), p. 82.

[76] Indeed, both Gaar (pp. 14-15) and Schwonke (p. 53) criticize the lack of detail in Dominik's technical descriptions. Schwonke even points to the fact that Dominik's scientific descriptions, being vague and inexact in spite of his technical background, called for protests from specialists who read his works. Daumann's rocket designs in

Die Insel (pp. 153-67) also lack clarity and precision.

[77] Dominik, Treibstoff, pp. 28, 36-38, 76, 146. Indeed, the incident of the explosion of Dr. Hegemüller's first rocket, due to an improper mixing of the rocket fuel, reflects Dominik's demands for realism, his mature awareness of the need for accuracy in atomic research, and his recognition of the dangers to scientists in space research. Perhaps through this incident, Dominik hoped to recall the untimely death of German physicist Max Valier in a rocket car explosion in 1930.

[78] Lasswitz, Two Planets, pp. 12-15.

[79] Gail, Der Stein, p. 172; Hans Hardt's Flight, pp. 66-67. Oberth, in his "Stationen im Weltraum," in Die Möglichkeit der Weltraumfahrt (pp. 227-35), praises Gail's notion of a space station in its design and conception. Oberth also appreciates his realistic considerations concerning the possibility of such a station sustaining life, and its use for scientific research and further space travel.

[80] Lasswitz, Two Planets, pp. 29, 44-49, 180-81.

[81] Daumann, Die Insel, pp. 52-64, 133-36. The food is produced from such elements as calcium, phosphorous, magnesium, nitrogen (Stickstoff), and carbon (Kohlenstoff), among others. Die Insel alludes here to apparent problems with food shortages in Europe during the late 1930s. It specifically relates that Professor Caffarelli and others had to leave their Italian homeland in order to obtain food and "living space" when an organized rule or Imperium (the Fascists) finally came to Italy (p. 134).

[82] Lasswitz, Two Planets, p. 20; Hanstein, Mond-Rak, p. 16. Daumann's Die Insel also speaks of an "island" of one thousand marvels. It is unclear, however, whether or not this is a man-made island.

[83] Hanstein, Mond-Rak, p. 92.

[84] Gail, Der Stein, pp. 172-74; Dominik, Treibstoff, p. 252.

[85] Lasswitz, Two Planets, pp. 13-15, 98, 178.

[86] Gail, Der Stein, pp. 281-82. Korf's intentions (and Gail's recommendations) to make use of solar energy rather than depend on coal to heat homes and operate factories are again considered in The Shot (p. 41). Moreover, Gail's suggestion to use solar power in the future rather than rely on coal, reveals the influence of his times and Weimar's predicament due to dwindling coal resources. Knowing that Germany had been obligated by the Treaty of Versailles to surrender

the rich coal mining region of the Saar to France, Gail looked at new alternatives for energy in the face of this unreliable source. Indeed, he makes particular reference to the loss of this region, when Korf bitterly condemns the fact "that the French are making steel with our Saar coal" (The Shot, pp. 17, 30).

[87] Daumann, Protruberanzen, pp. 69-74, 112 and Die Insel, pp. 50-59, 136. Daumann is most likely making references to the shortages of energy resources in Germany during the late 1930s when his Professor Caffarelli speculates on the potential and practical applications of both solar and ocean wave energy.

[88] Ley, "SchluBwort" to Die Möglichkeit der Weltraumfahrt, p. 340. And, of course, we know today that rocket voyages to the moon are possible, and that space travel is indeed closer to realization.

[89] Hanstein, Mond-Rak, pp. 91-92.

[90] Oberth has examined the practical and feasible nature of space stations in his "Stationen im Weltraum." He remarks on the realistic nature of the station described in Gail's Der Stein vom Mond with regard to its ability to sustain life, and points to the possibility that such a station could serve scientific pursuits and other practical goals (pp. 227-35). Our Western space-orientated society knows that such items as weather satellites, unmanned and manned spacelabs, "Skylabs" or space stations, and space shuttles (Lasswitz's Martian flight vehicle) are in fact an actuality. See Reginald Turnill's The Observer's Book of Unmanned Spaceflight (London: Frederick Warne and Co., Ltd.), pp. 19, 21, 22, 40, 57, 73.

[91] It is noteworthy that at the time of the publishing of Lasswitz's and Daumann's works, the German chemical and synthetic dye industries were well developed (Landes, Unbound Prometheus).

[92] Lasswitz, Two Planets, p. 36.

[93] Lasswitz's "Seifenblase" (pp. 8, 10), Sandt's Cavete, Gail's The Shot (pp. 37, 77) and Hans Hardt's Flight (pp. 26-38), Hanstein's Mond-Rak (pp. 14-16), Harbou's The Rocket (pp. 50-51, 73), and Dominik's Treibstoff (pp. 214, 220, 252), all emphasize the theme of "freedom" for scientific research and to pursue the truth, in opposition to any political or financial obstacles.

[94] Just as scientific advances, like poisonous gas, had been used for military purposes in World War One, scientists, like Wernher von Braun, and technology, like rockets or missiles, were exploited and employed for political and national purposes during the Nazis' imperialistic (post-1935) years.

[95] Lasswitz, *Two Planets*, p. 2. This reference to a balloon flight mirrors the influence on Lasswitz of Andrée's actual, although unsuccessful, attempt to journey to the North Pole via a balloon (Ley, *Rockets*, pp. 43-44).

[96] Lasswitz, *Two Planets*, p. 5. In contrast to the later military abuse of air balloons and Zeppelins in World War One, as tools to observe or bomb enemy territory, Lasswitz looked upon the Zeppelins specifically as a technological means to scientific and social progress ("Das Wunder des Zeppelin," p. 277).

[97] Lasswitz, *Two Planets*, p. 22-24, 245, 396. The Martian scientists, as agents of *Nu* (Martian for Mars, p. 26), represent the philosophy of *Nume*. This Martian philosophy, which suggests the influence on Lasswitz of the Kantian *Noumenon*, advocates peace and the peaceful use of technology.

[98] Gail, *Der Stein*, pp. 72, 86-89, 118-19 and *The Shot*, p. 31.

[99] Dominik, *Treibstoff*, pp. 130-32, 204-14, 220, 250-55, esp. p. 252, 305-308. Lassmann, in his "Utopien und ihre Leser," *Neue Volksbildung*, Buch und Bucherei, 8 (1957), insists that Dominik expresses much of the nationalistic fervour of the Nazi period in his glorification of German science, especially rocket development. Dominik's national pride in German technological development is clearly evident in *Treibstoff*. However, in opposition to the insular "Germanic ideology," he implicitly and explicitly reveals his utopian desire for international co-operation in scientific and rocket development. The theme of peace, or the desire that air-or spaceships be used only for scientific and social or commercial and colonizing purposes is found also in: Lasswitz's "Seifenblase," p. 13; Sandt's *Cavete*, pp. 13, 31-38, 125-28, 158, 172-73, 194-98, 210-20, 232-33; Hanstein's *Mond-Rak*, pp. 50, 91-92; Harbou's *The Rocket*, pp. 145-47, 161; Gail's *Hans Hardt's Flight*, p. 67; and Daumann's *Die Insel*, pp. 48, 59-64.

[100] Lasswitz, *Two Planets*, pp. 12-17, 41; Gail, *Der Stein*, p. 172-73, 178 and *Hans Hardt's Flight*, pp. 66-67; Hanstein, *Mond-Rak*, p. 91-92.

[101] Lasswitz, *Two Planets*, pp. 29, 44, 49, 178-81; Daumann, *Die Insel*, pp. 59-64, 122-24, 133-36.

[102] Lasswitz, *Two Planets*, pp. 20-24; Hanstein, *Mond-Rak*, p. 16.

[103] Gail, *Der Stein*, pp. 172-74; Dominik, *Treibstoff*, p. 252.

[104] Hanstein, *Mond-Rak*, p. 92.

[105] Lasswitz, Two Planets, pp. 13-15, 62, 98, 178-81.

[106] Gail, The Shot, p. 41. The theme of the peaceful, constructive use of solar energy is seen again in Gail's Der Stein, pp. 183, 191, 281-82.

[107] Daumann, Die Insel, pp. 50-59, 60-64, 122-24, 136 and Protruberanzen, pp. 71-74, 85, 99-107, 112, 131-38.

[108] Lasswitz, Two Planets, pp. 160-72, esp. p. 166, 244-47, 256-69. The negative image of Englishmen as "reckless" imperialists is presented as well in Sandt's Cavete, pp. 51 ff. and 208-14.

[109] Harbou, The Rocket, pp. 19-20, 31-51, 73. Harbou again expresses anti-English sentiments in Metropolis, p. 89. Gail, Der Stein, pp. 157, 161-62. The image of Englishmen as unscrupulous, profit-orientated businessmen or "GroBkaufleute" is portrayed also in Sandt's Cavete, pp. 51 ff. and 208-14.

[110] Daumann, Die Insel, pp. 113-14, 192-206. In Treibstoff, one of Dominik's novels from the Nazi era, the Italians and Japanese are, oddly enough, sometimes viewed negatively, suspected on occasion of being saboteurs or thieves. Little, however, is said regarding the English. Indeed, the only instance is a harmless remark concerning the presence of an English ship, the "Lady Jane," in Halifax harbour. Its Captain Brewster sights an apparent "UFO" that is, in fact, the debris from an exploded German rocket (pp. 38-39, 95, 153-59, 160-69).

[111] The reasons for international rivalry in the science fiction of the Imperial period clearly mirrored the politically and militarily motivated struggles between England and Germany in Africa, for instance, and during World War One. The motives in the Weimar literature illustrated actual economic and commercial antagonisms, especially those directed towards England, who was a party to the economically disruptive Versailles Treaty. England, moreover, in co-operation with other European nations, had attempted to ostracize Germany from the international scientific community, and prevent the entrance of her scientists into international scientific organizations, which, prior to the war, they had dominated (Forman, pp. 1-6, 111). These German writers were most likely aware of these attempts to ostracize Germany, and, thus, this latter consideration by Forman perhaps explains in part why, in the Weimar period at least, the German science fiction authors voiced anti-English sentiments. In the literature of the Nazi period, the motives obviously reflected the political and military struggles of Germany's post-1935 aggressive period, which culminated in the Second World War.

[112] Lasswitz, Two Planets, pp. 160-66, 246-47, 256-59. Military and political reasons also prompt antagonism between Englishmen and Germans in Sandt's Cavete, pp. 51 ff.

[113] Gail, The Shot, pp. 17, 30. This quotation, of course, shows the author's bitterness at Weimar Germany's actual international situation, as an economically impoverished nation dependent on any foreign investment (Forman, pp. 1-6, 111, 210 ff.) for scientific research. His Der Stein also reveals such bitterness as Korf, motivated by a sense of foreign financial domination, remains determined to keep his "Werk ... eine Nationalangelegenheit des deutschen Volkes" (p. 90). Economic issues also form the basis for anti-English sentiments in Sandt's Cavete, pp. 208-14 and Harbou's The Rocket, pp. 47-51.

[114] Gail, Der Stein, pp. 157, 161-62 and The Shot, p. 68.

[115] Dominik, Treibstoff, pp. 95, 153-69. The motive of theft and the suspicion of sabotage of German scientific work also promote friction in Harbou's The Rocket (pp. 19-20, 31-51), and Daumann's Die Insel (pp. 31-32, 165-67) and Protruberanzen (pp. 241-43, 275-84).

[116] Landes examines the mutual respect and friendly rivalry that existed between Americans and Germans in the late nineteenth century, with regard to each other's scientific and industrial development and financial wealth. Forman (pp. 206 ff.) looks in depth at the financial contributions made by American and Japanese businesses to German scientific research in the Weimar period. Gail (Physik, pp. 112, 117-19), Ley (Rockets, pp. 99, 123-24, 149, 174, 184-85, 224), and Ley /"SchluBwort" (pp. 329 ff., esp. pp. 331-32) and "In den Tiefen des Weltraumes" (pp. 2-3), in Die Möglichkeit der Weltraumfahrt/, point to the joint American-German co-operation in rocket development during the Weimar period, and the mutual regard held for each other's contributions to science and technology. The formal military and diplomatic alliances amongst Germany, Italy, and Japan (1936-1945) are, of course, famous, and include: the October Protocols (1936) between Germany and Italy, the Anti-Comintern Pact (1936) amongst Germany, Japan, and later Italy (1937), the Pact of Steel (1939) between Germany and Italy, and the Tripartite Pact (1940) amongst Germany, Italy, and Japan.

[117] On the whole, the modern German science fiction looked favourably on America for one reason or another. Only Sandt's scholarly scientific work, Das Trio, warned of the threat of the "Americanization" of German culture through close scientific or financial ties, mechanization, and technology.

[118] Lasswitz, Two Planets, pp. 77, 104, 116, 379-86. The image of the Americans as technically capable, scientifically progressive, and co-operative is found again in Lasswitz's "Gegen das Weltgesetz" (pp. 128 ff.). The view of America as a politically and socially free and democratic nation, indeed the land of the future, is also portrayed in Two Planets. It is not surprising that Lasswitz's futuristic society, offering freedom, self-determination, and technological advances, consists of the "United Martian States."

[119] Evidently, during the Weimar period, the economically and scientifically based friendship between the Japanese industrial and German scientific communities was very close. In 1922, the Japanese industrialist Hajime Hoshi donated two million Marks (10,000 American dollars) to the German Notgemeinschaft for the support of research in chemistry. Later in that year, the Hoshi Fund was set up, which contributed 2,000 yen (1,000 American dollars) per month for three years to chemical and ultimately atomic physics research (see Forman, pp. 312-14). With this as an example of the type and closeness of the German-Japanese relationship, it is little wonder that science fiction from this era looks so kindly on the Japanese.

[120] Hanstein, Mond-Rak, pp. 21, 27-28, 38. Harbou also views the Japanese with positive fascination (Metropolis, p. 89).

[121] Dominik, Treibstoff, pp. 76, 232 ff., 266-82. Schwonke maintains that Dominik's science fiction presents the Japanese in a negative light (p. 162). This may be the case in other works by him. In Treibstoff, however, the opposite is true. Daumann's Protruberanzen also shows an appreciation for actual American contributions to scientific and rocket research (pp. 61-69, 87). His Die Insel, moreover, like Dominik's Treibstoff, panders to the post-1935 alliances by portraying the Italians in a positive light, in the character of the scientifically adept Dr. Caffarelli, and by focusing on Italian scientific contributions to the world, notably those of Galvani and Volta.

[122] As a scientist of the Weimar period, Gail was obviously aware of and appreciated both America's growing interest in astronomy, as well as the contributions to rocket research made by American scientists like Dr. Goddard (Gail, Physik, p. 117). American financial donations to German rocket and atomic research were also substantial. This points to another or financial explanation for actual American-German friendship in the 1920s and early 1930s, and, thus, for the German-American friendships expressed in the Weimar science fiction by authors like Gail. In addition, private American citizens, like the banker Henry Goldman, for instance, as well as major organizations such as the Rockefeller Foundation, General Electric, and the Smithsonian Institute, contributed heavily to scientific or atomic physics research in German universities during the Weimar period (Forman, pp. 273-74, 316).

[123] Daumann also seems aware of the actual contributions made by American organizations such as General Electric (Forman, p. 273) to German atomic physics research during the Weimar period.

[124] Gail, Hans Hardt's Flight, pp. 9-14, 26-38; Daumann, Protruberanzen, p. 85. Protruberanzen offers other instances where American business is portrayed as generous to German research. The fictional Pittsburgh and Western National Banks wish to finance Bracke's and Hegar's solar research (p. 101).

[125] Lasswitz, Two Planets, pp. 379-86.

[126] Gail, Hans Hardt's Flight, pp. 9-14, 26-38. The need for financial support of scientific endeavours also prompts an American-German alliance in Hanstein's Mond-Rak, pp. 11-16 and Daumann's Protruberanzen, p. 85.

[127] Gail, The Shot, p. 13; Dominik Treibstoff, pp. 7-8, 15-22, 84-88, 95, 121-23, 130-35, esp. p. 134, 146, 153-69, 173-77, 204-10, 255.

[128] They opposed any aggressive form of conflagration, with its imperialism and resulting exploitation of human and natural resources.

[129] As a result of earth's initial violent provocation, the Martians conquer earth, forcing their culture upon human beings. Even the food becomes synthesized Martian varieties of "coal sausage, retort toast, mineral butter, artificial bread ...." Indeed, it is "considered ... more patriotic" to order synthesized rather than grown food (Lasswitz, Two Planets, pp. 240-44, 270).

[130] Ibid., pp. 50-51, 113, 120, 133-39. Even after the initial provocation by the English and the formation of the Martian "Protectorate" over earth, the philo-Bati or Martian pro-earth League still seeks peace between the two planets (pp. 201-203, 205-12, 214, 317). Krysmanski (p. 90) suggests that the Martians' behaviour reflects the European period of imperialism and colonialism, meaning that they intended to colonize and exploit earth. Kretzmann, on the other hand, in agreement with this author's claim, maintains (p. 426) that their intentions were peaceful. The Martians clearly reveal Lasswitz's hope for international peace in that they desired only to conduct commercial and cultural exchanges with earth, using the Pole as their trading, rather than military centre.

[131] Gail, Hans Hardt's Flight, p. 67; The Shot, p. 41; Der Stein, p. 183. Far from the "mad-scientist" image, engineer Korf (Der Stein) fears the misuse of his work by egotistical individuals and nations to decide the destiny of peoples. Therefore, it "ist der Grund für unsere Geheimwirtschaft wenn die sogenannten Kulturnationen ahnen würden, was hier vorgeht, dann würde ein rasender Vernichtungskampf gegen mich einsetzen, und statt Aufbau und Kulturarbeit käme die sinnlose Zerstörung!" (p. 183).

[132] Dominik, Treibstoff, pp. 204-11, 220, 226-29, 252, 255, 308. Other modern German science fiction works reflect this desire for international peace, including: Sandt's Cavete, Schultsky's Im Saturnsystem, Hanstein's Mond-Rak, and Heichen's Jenseits der Stratosphäre. Neither Daumann's Die Insel nor Protruberanzen, moreover, mentions any particular war or refers to Germany's post-1935

imperialism. On the contrary, Daumann implicitly reveals his opposition to the imperialistic exploitation by Nazi Germany through Professor Caffarelli (Die Insel), who envisages a new and peaceful society where his food synthesizer can be used to produce food (Nahrung) for the world (pp. 59-64), and through Drs. Bracke and Hegar (Protruberanzen), who attempt to solve the problem of limited natural resources, not by aggressive Nazi-like military exploitation of other countries, but by the peaceful investigation of the potential of solar energy (pp. 101-102, 176).

[133] The authors opposed virulent forms of nationalism, with their consequent expression of inhumanities to individuals or groups of different racial, religious, ethnic, or national origins, and their resultant denial of multi-culturalism.

[134] The Martian infiltrator Ell, whose father, significantly, had married a German governess living in England (pp. 114, 137-38), makes his initial contact, again significantly, with the Germans, their scientists, and their culture. Ell explains that he "went to Germany, ... studied and learned about the misery of this species at one of the places where the highest civilization and learning on this planet manifested itself" (p. 139). Further evidence of Lasswitz's liberal nationalism is presented on the occasions when "German" scientists discover the Martians at the Pole, and the "German" scientist Grunthe, in co-operation with the Martian philo-Bati faction, attempts to open diplomatic channels to promote peace between the two planets (pp. 60, 284). Lasswitz's contemporary, Emil Sandt, also mirrors his German patriotism in Cavete, where a "German" engineer Rufart builds a great airship.

[135] Lasswitz, Two Planets, pp. 21-23, 24-30 ff., 104, 133. The Martians (Nume), as representatives of a morally and technologically superior culture or "superior foreign supernation," do not represent an expression of Lasswitz's German nationalism. In the first place, it is obvious from his other scholarly works, such as "Der tote" and "Unser Recht," that Lasswitz believed in the possibility of superior alien life forms. The Martians, therefore, symbolize an example of pure speculation on such possibilities. In the second place, it is clear in Two Planets that the peaceful united Martian society, with its advanced culture, ethics, science, and intraplanetary or international Martian Federation, is one to which "all" men of earth must aspire and one day emulate for it "looms before us humans as a distant ideal" (p. 36) (also see pp. 104-106 and Lasswitz quoted by Kretzmann, p. 420). Such notions of intraplanetary scientific and political federations were also considered, as we have seen, by Condorcet and H. G. Wells. Lasswitz, as a representative German science fiction writer, carried on this "utopian" tradition. Lasswitz's humanitarianism is again evident in "Seifenblase." No less than the Bensalemites or Christianopolitans, the "Saponier (so wollen wir die Bewohner der Seifenblase nennen)" offer their visitors, Onkel Wendel and his nephew, "Getränke," "Nahrung," and "Suppen" (pp. 13, 15).

[136] In The Shot, Korf mirrors Gail's liberal patriotism as he claims: "my spaceship must and will remain a German national affair" (p. 17), and "German inspiration and German ability" accomplished the first successful rocket flight, in the Geryon (pp. 44, 75-77). Councillor Heyse, a friend of Korf, also expresses such nationalism, and voices a typical Weimar hope for the German nation to rise again:

> "The Dirigible, the Graf Zeppelin, years ago spread over the whole earth the fame of German spirit, German technique, and German work, so that our former enemies recognized that this nation was alive, despite all suppressions .... And now the lofty music of German ability shall resound to the canopy of stars--in distant unknown worlds the German colors shall shine and announce that this nation lives" (p. 30).

Gail's Der Stein, pp. 89-90 and Hanstein's Mond-Rak, p. 213, also make manifest elements of Weimar German patriotism.

[137] Gail, The Shot, pp. 37, 42.

[138] In Der Stein, Korf shows his disapproval of ethnic and cultural racism as he condemns the virulent anti-English attitudes of engineer Grundlach (p. 161) and the anti-Latin American sentiments of Herr Berger (p. 68). Archeologist Burns, moreover, clearly transcends the phenotypic racism of Buddy (anti-Indian, pp. 208-209) and the Spanish-Mexican landowner, Don Pedro (anti-Black, pp. 24-28, 41), when he wishes to marry "das Indianermädchen, Tuxtla" (p. 157), and when he defends the black servant, Mingo, against the abuses of his employer, Don Pedro (p. 26). Such humanitarian opposition to prevalent late nineteenth century cultural and religious racism is also implied in Sandt's Cavete, when Fritz Rufart rescues James and Minnie from the English (pp. 53-55). James, significantly, is Jewish.

[139] In an attempt to appeal to the Nazis' nationalist ideology, Dominik's German scientists initially hope to keep the nature of their rocket fuel a secret from the Italians and Japanese, to ensure that the creation of the rocket itself and also its fuel formula remain "German" accomplishments (pp. 130-34). Moreover, the fact that the nature of their scientific work deals with rockets is an obvious pandering to the Nazi period's toying with rocketry. Daumann, too, panders to both the Nazi era's nationalist mentality, as German scientists "alone" seek the solutions to world energy problems in Protruberanzen (p. 64), and to Nazi technology's emphasis on rocketry, as Professor Caffarelli (Die Insel, pp. 59-64) and Drs. Hegar and Bracke (Protruberanzen, p. 176) consider peacetime uses for their rocketcrafts (Raketenapparate).

[140] Dominik, Treibstoff, pp. 38-39. It is true that in some of his other science fiction works, Dominik does present those of other races or nations, including the English, as saboteurs or spies. He, thereby, reveals his own national bias (Schwonke, p. 54; Lassmann, pp. 332-33). In Treibstoff, however, his only mention of the English is in the harmless context of a "UFO" sighting, made by Captain Brewster while on the English ship "Lady Jane," docked in Halifax harbour.

[141] Ibid., pp. 76, 95, 129, 153-68, esp. 160-63. Daumann's representative works from the Nazis' imperialistic (post-1935) era also reflect his clear opposition to any expressions of inhumanity or racism. In Protruberanzen, for instance, it is obvious that the German scientists, Bracke and Hegar, wish to perfect a means to utilize solar energy to serve all humanity, not just the Germans, and by implication, Nazi Germany. Indeed, it is explicitly stated that solar energy could be used by and for all races or nations of people, in particular, those in colder climates, whether Norway or Canada (the Yukon, Ottawa, and Alberta) (pp. 74, 99-107, 131-38, 176, 199).

[142] Ernst Bloch, Das Prinzip Hoffnung, 3 vols. (Frankfurt-am-Main: Suhrkamp Verlag, 1959), 2:549.

[143] Lassmann, pp. 332-33.

[144] Segal, p. 10.

[145] Helmut Swoboda, in Utopia. Geschichte der Sehnsucht nach einer besseren Welt (Wien: Europa Verlags-AG., 1972), agrees that Lasswitz's Two Planets, for instance, is a utopian work (p. 35).

[146] Indeed, unlike the rich English tradition of dystopias (in the vein of George Orwell's Nineteen Eighty-Four and Aldous Huxley's Brave New World), which revealed an awareness, in fact focused on the negative prospects if scientific developments were allowed to progress unimpeded, the German science fiction failed to consider the negative side of scientific progress. For example, the writers neglected to consider that increased mechanization and computerization could lead to social unrest as a result of job losses, or that sophisticated technology and communications networks could produce the likes of Dachaus or "Big Brother" states. Only Harbou's Metropolis demonstrated a recognition of the threat of dehumanization when, with too much faith in science and technology as the social panaceas, technology was allowed to progress at the expense of social welfare, moral boundaries, or worst, mankind as a whole.

[147] Segal claims that science fiction does not represent technological utopianism because in science fiction "technology is only a means to an end and not, as in technological utopianism, virtually an end in itself" (p. 10).

CHAPTER FOUR

CONCLUSIONS:

German Technological Utopias in Perspective

The attempt has been made to create a model of technological utopianism in an effort to demonstrate that the characteristics of certain early scientific utopias, and in addition some modern German science fiction can satisfy the criteria of such a prototype. The works chosen for study may be classified as one of two types of technological utopias--an early philosophical and a modern literary variety. As part of a distinct and specific European and German technological utopian tradition, they also belong to the early (philosophical) and modern (literary) science fiction heritage. What, then, is the historical and cultural significance of these selected examples of modern German science fiction in the light of classification schema for the quality, tradition, and value of science fiction and technological utopianism in general?

Some students of science fiction insist that it is a unique American genre.[1] Others, while acknowledging its modern European representatives, maintain that it is quite unrelated to the utopian or Staatsroman tradition.[2] This investigation, however, has focused on the European, and especially German aspects of and contributions to modern science fiction,[3] as well as the utopian elements inherent in select examples from this genre. Certain scholars, including Martin Schwonke,[4] agree that the main characteristics of modern European and German science fiction do stem from the early utopian or Staatsroman tradition. Alice Gaar looks upon Plato's Critius as "pioneer science fiction,"[5] while Kepler's Somnium must surely be regarded as a pioneer in the German "philosophical" science fiction or technological utopian tradition. The European and German "literary" scientific utopian heritage is also very rich,[6] and lends further support to the argument that the German works looked at here are historically and culturally valuable. They are valuable, that is, as modern ambassadors of an extensive European (and German) "philosophical" as well as "literary" utopian science fiction tradition.

True, a few authors willingly acknowledge the place of modern German science fiction within the general framework of European utopian thought. Yet these, and including Martin Schwonke and Ernst Bloch,[7] fail to analyse or recognize a distinct technological utopian tradition in science fiction. They include within their studies examples of non-utopian literature--social satire, Märchen, travel tales or Robinsonaden, and psychological dramas--, which may or may not offer scientific content.[8] Some misclassify technological utopias as pure fantasy,[9] while still others generalize and, indeed, misinterpret both the nature of myth[10] and utopianism by suggesting that science fiction is merely "modern mythology."[11] Certainly this fiction can express social criticism,[12] often through temporal and spatial displacement or the use of aliens, and may contain elements of or themes common to satire and myth.[13] Similarly, pure fantasies, mythology, and satires can contain an appreciation for contemporary scientific development,[14] or employ science either symbolically or for some satirical purpose. Unlike some science fiction, however, these are not in the technological utopian tradition.[15]

Technological utopias or utopian science fiction works clearly distinguish themselves from Märchen, social satires like Gulliver's Travels and Cyrano de Bergerac's Other Worlds, or myths of the Daedalus type. Whether early or modern, philosophical or literary, they illustrate an extrapolated future based, in part, on contemporary social and scientific realities, and one that represents a desired and quite realizable goal. Technological utopias open new vistas that present novel social and scientific alternatives to satisfy mankind's future "needs." They offer socio-scientific "hope" as a remedy for the ever-present contemporary malaise of boredom or for what Mannheim calls Sachlichkeit (prosaic, mundane reality). In terms of its cultural significance, then, the modern German science fiction considered in this study belongs to a unique and specific technological utopian tradition. Unlike pure satire, Märchen, or mythology, it presents mankind with new (and theoretically better) social and scientific ideas, models, and leaders for the future society. In Alice Gaar's words "the driving impulse behind serious science fiction is the quest for the New Environment and the New Man."[16]

The adjective "serious" used in Gaar's analysis is important. Many writers deny that this variety of literature is socially and historically significant.[17] Yet, while it is true that much trivial science fiction exists,[18] the level[19] represented here was produced by well-educated individuals, and mirrors serious views of historical and cultural relevance. In the first place, each of our modern German authors, like his technological utopian predecessors, spoke in "the language of his group,"[20] and projected thoughts and images significantly shaped and influenced by the forces of his "sociology of knowledge." Accordingly, his high-calibre science fiction becomes another historically and culturally valuable indicator of socially determined views and attitudes as it documents both contemporary scientific priorities, as well as the social and political biases prevalent among the author's social and professional peers.

When its content is compared with that of earlier scientific utopian literature, our modern German science fiction also yields a significant index of historical change. It clearly illuminates a process of growing sophistication and shows the transformation of a social, scientific, and utopian outlook that emerged from the revered society of philosophers and theocrats, as it proceeded to the world of modern technocracy. Here was a modern pluralistic society where women were offered greater and more demanding career opportunities. They achieved professional positions and ceased being mere breeders or homemakers; yet they were subject to modern forms of discrimination regarding jobs and images. The new society venerated not an elite of aristocratic academicians, or mediaeval priests, not the early modern Protestant ministers, or the bourgeois professionals who included managers, businessmen, and scientists, but only the scientist and engineer. These technocrats alone were the heroes of society. They shared their socially important position with no other social group. They alone set its moral tone. The technocrat who created the technologically-orientated goal did not combine philosophy and science, or use religious faith and science, nor business-management and science as his means. Instead, the heroic engineer represented mainly a world of applied science or technology, which was itself historically and culturally significant. Since they were socially determined, the science and technology emphasized those specialized areas that were the nation's scientific and research priorities,[21] mirrored the contemporary state of scientific advances, and represented a technology that was far more sophisticated than that described by any utopian predecessor. Politically speaking, furthermore, the modern authors developed the picture of a society in which political friends and foes, as well as motives for international alliances and conflicts, significantly projected a new stage in international power politics. This projection, of course, also documented the influences of the authors' twentieth century German milieu, and contrasted with the political relationships and outlooks important to their utopian predecessors. Finally, this society of an engineering "priesthood" was yet to be realized. In consequence, it was still truly "utopian" according to Mannheim's definition, and not like that society envisaged in the post-war German (and North American) science fiction, which is highly commercialized and mirrors a "space-age ideology."

While the content of the utopian fiction changes, the form of the utopian process remains constant. In the second place, then, this technological utopian literature, from early to modern times and in Mannheim's terms, stands as a culturally, socially, and historically valuable indicator of opposition to the status quo. The evidence presented in the literature makes it clear that the authors consistently rejected illiberal and inhumane views regarding the position and function of women. They took umbrage at any abuse of authority or knowledge by scientific and political elites, while they readily supported the valuable place of the scientist and science and technology in society. With regard to political affairs, all opposed the expression of debased or imperialistic inhumane forms of political regionalism or nationalism.

These opposing views are a positive and significant statement of the authors' transcendence and commitment to a state of mind that belongs to the utopian and historical tradition advocating: (1) social mobility, (2) liberal-humanitarianism (Mannheim), (3) responsible social and scientific behaviour, (4) social and scientific freedoms (Bloch), and (5) ideas of progress, peace, and hope for the future.

This tradition, moreover, clearly includes certain works by both Plato and writers of serious German science fiction. Contrary to the positions of Ernst Bloch and Karl Mannheim,[22] and no less than Andreae, Francis Bacon, or Wells, the ancient Greek as well as the modern German authors revealed an appreciation for woman's intellect and espoused a demand for women's freedom in education. In spite of the occasional negative images projected, women still fared quite well in these technological utopias of quality science fiction. Although the elites varied in kind (from philosophers to technocrats), elitism appears to be a constant in the technological utopian tradition. The elites, moreover, whether composed of philosophers, Protestant ministers, business managers, or scientists, were consistently expected to behave in a responsible, humanitarian manner.[23] While all the authors, from Plato through Condorcet to H. G. Wells and the modern German writers, displayed a naiveté regarding the possible negative, indeed, regressive effects of increased technological development,[24] all, including Roger Bacon and Andreae, desired partial, if not total freedom in scientific research. All looked positively upon science and technology as one, if not the only means to create a more humane, peaceful, and progressive world, and one that must benefit all people. Although regional or national biases were evident, all, from Plato to Andreae and Francis

Bacon to Condorcet and Wells to the modern German authors, opposed war and virulent forms of regionalism or nationalism. Instead, all consistently demanded peace and interregional or international harmony and freedom, and humanitarian behaviour towards all people.

As an ambassador, then, of a utopian and historical tradition of freedom and liberalism, modern high-calibre German science fiction remains historically and culturally constructive. It is also valuable in that, like its utopian predecessors and contrary to the claims of Howard Segal,[25] it envisages genuine technological utopias. True to technological utopianism, the new society, created by means of science, technology, and social measures, offers freedoms to all social groups and respect to members of the scientific and engineering community. It admires the latter's scientific and technological accomplishments. As well, it illuminates a desire for international harmony and scientific co-operation. This fictitious society, moreover, stands as a non-violent expression of revolutionary views about a new and better world, while the literature itself represents a popular means for the positive thinking intellectual to mould the public mind. As popular literature, modern German science fiction can again be looked upon as culturally and historically significant in that the values, images, and viewpoints expressed can be seen to influence public opinion. It can condition the public attitude to women, to scientists, to science, and to international affairs. As a final statement, one can look upon this literature as a valuable guide and portent to the future. It shows us that the forces of science and technology can be our allies only if tempered with a sense of morality, humanism, trust, and sharing at the national and international levels. With this sense of harmony, the new world does not have to be the sterile, unproductive realism of war, puerile imperialism, whether military, economic, or cultural, and accompanying these, a race for armaments. Instead "the shape of things to come" can contain some of the idealism inherent in the technological utopias of modern German science fiction. Utopia must not simply be one place on Oscar Wilde's "map of the world," but the world itself.

F O O T N O T E S

CHAPTER FOUR

[1] See, for example, Frederik L. Polak, *The Image of the Future*, trans. and abridged by Elise Boulding, foreword by Kenneth Boulding (San Francisco: Jossey-Bass Inc., Publishers, 1973), p. 191; and Ronald M. Hahn, "Wissenschaft und Technik = Zukunft. Geschichte und Ideologie der SF-Hefte," in *Science Fiction: Theorie und Geschichte*, eingeleitet und hrsg. Eike Barmeyer (München: Wilhelm Fink Verlag, 1972), p. 220.

[2] See Hans-Jürgen Krysmanski, *Die utopische Methode. Eine literatur-und wissenssoziologische Untersuchung deutscher utopischer Romane des 20. Jahrhunderts*, Dortmunder Schriften zur Sozialforschung, Band 21 (Köln: Westdeutscher Verlag, 1963), p. 89; Ernst Bloch, *A Philosophy of the Future*, trans. John Cumming (New York: Herder and Herder, An Azimuth Book, 1970), p. 88; Glenn Negley, *Utopian Literature. A Bibliography with a Supplementary Listing of Works Influential in Utopian Thought* (Lawrence, Kansas: The Regents Press of Kansas, 1977), p. xiii; Margaret Mead, "Towards More Vivid Utopias," in *Utopia*, ed. George Kateb (New York: Atherton Press, 1971), p. 52; and Michael Pehlke and Norbert Lingfeld, *Roboter und Gartenlaube. Ideologie und Unterhaltung in der Science Fiction Literatur* (München: Carl Hanser Verlag, 1970), pp. 10-12.

[3] It is, of course, significant that a Belgian (Hugo Gernsback) coined the name "science fiction" (J. Asimov, "Science Fiction," *Bild der Wissenschaft*, no. 2 (1970): 117-18), and that a Czech dramatist, Karel Capek, first used the term "Robot" (J. Asimov, p. 117), while Germans Fritz Lang and Thea von Harbou made the first science fiction films, and German scientists like Willy Ley and Wernher von Braun helped to develop the American space programme at NASA, which in turn promoted the continued proliferation of modern American science fiction.

[4] Martin Schwonke, "Naturwissenschaft und Technik im utopischen Denken der Neuzeit," in *Science Fiction. Theorie und Geschichte*, p. 58, and Schwonke, *Vom Staatsroman zur Science Fiction. Eine Untersuchung über Geschichte und Funktion der naturwissenschaftlich-technischen Utopie* (Stuttgart: Ferdinand Enke Verlag, 1957), p. 146, Klein, like Schwonke, identifies science fiction with such "naturwissenschaftlich-technischen Utopie" as F. Bacon's *New Atlantis* or Andreae's *Christianopolis* in his *Zukunft zwischen Trauma und Mythos: Science Fiction zur Wirkungsästhetik, Sozialpsychologie und Didaktik eines literarischen Massenphänomens* (Stuttgart: Ernst Klett, 1976), pp. 23-30, 235, while Oscar Shaftel suggests that science fiction is not just "dimly related in method to the great utopias" by Plato and Wells in his "The Social Content of Science Fiction," *Science and Society* 17, no. 2 (1953): 97.

[5] Alice C. Gaar, "German Science Fiction: Variations on the Theme of Survival in the Space-Time Continuum" (Ph.D. dissertation, University of North Carolina: Chapel Hill, 1973), pp. 2-3.

[6] See, for example, Julius von Voss's *Ini. Ein Roman aus dem einundzwanzigsten Jahrhundert* (Berlin: Bei Karl Friedrich Amelang, 1810). For more examples from this literary heritage, see Pierre Versins' *Encyclopédie de L'Utopie, des Voyages Extraordinaires et de la Science Fiction* (Lausanne: Éditions L'Age d'Homme S.A., 1972), pp. 29 ff.

[7] Schwonke, *Vom Staatsroman zur Science Fiction*, pp. 19-21; Ernst Bloch, *Das Prinzip Hoffnung*, 3 vols. (Frankfurt-am-Main: Suhrkamp Verlag, 1959), 1:507-509; 2:1042. Others who misclassify pure satire or fantasy as technological utopian or science fiction literature include: Karl Debus, "Raumschiffahrtsdichtung und Bewohnbarkeitsphantasien seit der Renaissance bis Heute," in *Die Möglichkeit der Weltraumfahrt. Allgemeinverständliche Beiträge zum Raumschiffahrtsproblem*, hrsg. Willy Ley (Leipzig: Verlag von Hachmeister und Thal, 1928), pp. 67-105; James O. Bailey, *Pilgrims through Space and Time: Trends and Patterns in Scientific and Utopian Fiction* (New York: Argus Books, Inc., 1947), pp. 16, 26; Nell Eurich, *Science in Utopia: A Mighty Design* (Cambridge, Mass.: Harvard University Press, 1967), pp. 16-17, 31, 52-53; Willy Ley, *Rockets, Missiles and Men in Space* (New York: The Viking Press, 1968), pp. 9-10, 20-23; Wolf-Dietrich Müller, *Geschichte der Utopie-Romane der Weltliteratur* (Bochum-Langendreer: Heinrich Pöppinghaus, o.H.-G. 1938), p. 12; Zoe L. Treguboff, "A Study of the Social Criticism in Popular Fiction: A Content Analysis of Science Fiction" (Ph.D. dissertation, University of California: Los Angeles, 1955), p. 29; R. D. Sween, comp., *Speculative Literature Used in U. S. Academic Courses*, Speculative Literature Bibliography, no. 1, The Karrmann Library (Platteville, Wisconsin: University of Wisconsin, 1972), #418 and #458; Barbara Kaplan, "Women and Sexuality in Utopian Literature" (Ph.D. dissertation, New York University, 1977), pp. 58, 63-67; Klein, pp. 24-25; Georg Locke, *Voyages in Space. A Bibliography of Interplanetary Fiction, 1801-1914* (London: Ferret Fantasy Ltd., 1975), passim; J. Asimov, p. 114; Alfred Lassmann "Utopien und ihre Leser," *Neue Volksbildung*, Buch und Bucherei, 8 (1957): 334; Versins, p. 31; and Stephen Papson, "A Qualitative Analysis of Western Literary Utopias: A Study of the Relationship of Utopian Ideas to their Socio-Historical Location (Ph.D. dissertation, University of Kentucky, 1976), pp. 235, and passim.

[8] Including: Lucian of Samosata's "Icaromenippus" and "True History," in *Satirical Sketches*, pp. 111-33, and pp. 249-97, trans. and intro. Paul Turner (Baltimore, Maryland: Penguin Books, 1961); R. E. Raspe's *Singular Travels, Campaigns and Adventures of Baron Münchhausen*, intro. John Carswell (New York: Dover Publications Inc., 1960); Jonathan Swift's, *Gulliver's Travels. Travels into Several Remote Nations of the World in Four Parts by Lemuel Gulliver*, ed. Peter Dixon and John Chalker, intro. Michael Foot (Harmondsworth, England: Penguin Books Ltd., 1977); Graziani Pfeiffer's (pseud.), *Agricolae Auletis. Sonderbahre Reisen in unbekandte Länder aus Richtig gehaltenen*

Diariis, aufgezeichneten Anmerckungen und Angemerckten Entdeckungen. Theils zum eigenen Zeit-Vertreib; Theils aber auch zum Vergnügen anderer Liebhaber abgefasst und an das Licht gestellet. Pars I von der Reise in Ophir. Gedruckt zu Hanochia, in der Ophirischen Landshafft Canaan. Bremen (?): Publisher Saurmann, 1721, 152 pp; Daniel Defoe's Robinson Crusoe (London: Thomas Nelson and Sons, Ltd., 1906); Voltaire's "Candide" and "Micromegas," in Candide, Zadig and Selected Stories, pp. 15-101, and pp. 173-91, trans and intro. Donald M. Frame (New York: New American Library, A Signet Classic, 1961); Cyrano de Bergerac's Other Worlds. The Comical History of the States and Empires of the Moon and Sun, trans. and intro. Geoffrey Strachan (London: New English Library Paperback, 1976); Franz Kafka's "Die Verwandlung," in Meistererzählungen, pp. 119-79, ed. Anna Otten (New York: Appleton-Century-Crofts, Educational Division, Meredith Corp., 1969).

[9] E. M. Kretzmann, "German Technological Utopias of the Pre-War Period," Annals of Science 3, no. 4 (1938): 430-31.

[10] This critique of certain views regarding the nature of science fiction and mythology is based on a reading of select articles dealing specifically with the nature of myth, including: Encyclopedia of Philosophy, 1967 ed., s.v. "Myth," by Alasdair MacIntyre, pp. 434-37; and International Encyclopedia of the Social Sciences, 1968 ed., s.v. "Myth and Symbol," by Victor W. Turner, pp. 576-81.

[11] Thomas C. Sutton and Marilyn Sutton, "Science Fiction as Mythology," Western Folklore 28 (1969): 230, passim.

[12] Treguboff (pp. 2, 33-34), Walter Hirsch, "The Image of the Scientist in Science Fiction: A Content Analysis," The American Journal of Sociology 63 (1957-58): 506, and L. W. Michaelson, "Social Criticism in Science Fiction," Antioch Review 14 (1954): 503-504, agree that science fiction can be used as a vehicle of social criticism and protest. Indeed, our science fiction certainly mirrors that form of criticism that Treguboff defines "as the implicit or explicit expression of a positive or negative attitude toward any aspect of our culture or people, such as the institutions, mores, values and motives" (p. 52).

[13] Margot Kadinsky, for instance, in "Über Science Fiction," der Anhang zu Der Mythos der Maschine. Aus der Praxis analytischer Psychotherapie by David Kadinsky (Bern: Hans Huber Verlag, 1969), sees "... eine Ähnlichkeit zwischen Science Fiction und Märchen ..." (p. 221) in their common theme of "striving" to overcome obstacles, either personal or social. References to ancient mythology can also be found in science fiction. (Plato's Critius plays on the myth of Atlantis, while Gail's Der Stein vom Mond and By Rocket to the Moon. The Story of Hans Hardt's Miraculous Flight make reference to ancient Mayan and Aztec myths).

[14] There are many examples of and studies on literature that reflect an appreciation for the contemporary science and technology, while at the same time are *not* science fiction. See Rudi A. Prusok, "The Use of Science and Technology in the Novels of Thomas Mann" (Ph.D. dissertation, Washington University, 1967); Walter Schatzberg, *Scientific Themes in the Popular Literature and Poetry of the German Enlightenment, 1720-1760* (Berne: Herbert Lang and Co., Ltd., 1973); and William E. Umbach, "The Reflection of Natural Science in German Literature from 1830-1859" (Ph.D. dissertation, University of Michigan, 1950).

[15] Helmut Swoboda, in *Utopia. Geschichte der Sehnsucht nach einer besseren Welt* (Wien: Europa Verlags-AG., 1972), pp. 19, 25-26, 40, agrees that satires, like Cyrano de Bergerac's *Other Worlds* and Swift's *Gulliver's Travels*, "kommt um die utopischen Modelle nicht herum" (pp. 25-26). Mary E. Bowen, in her introduction to *Iter Lunare: or, A Voyage to the Moon. Containing some considerations on the Nature of that Planet. The Possibility of getting thither. With other pleasant conceits about the Inhabitants, their Manners and Customs*, by David Russen, Gregg Press Science Fiction Series (Boston: G. K. Hall and Co., 1976), Bailey (p. 26), and Michaelson (p. 503) also suggest that satires, like those aforementioned, are not in the utopian or science fiction tradition. Mythical tales like *Daedalus* are not part of this tradition either.

[16] Gaar, introduction to dissertation, n.p.

[17] Klein (pp. 9-21, 38-160), for example, and Hahn (pp. 230-233), as well as Pehlke and Lingfeld (p. 11, passim), Manfred Nagl, *Science Fiction in Deutschland. Untersuchungen zur Genese, Soziolographie und Ideologie der phantastischen Massenliteratur* (Tübingen Schloss: Tübinger Vereinigung für Volkskunde E. V., 1972), pp. 16-18, and Eike Barmeyer, introduction to *Science Fiction: Theorie und Geschichte* pp. 12-13, look upon German science fiction as trite literature, which concentrates on a negative (or Fascist) ideology, and which emphasizes such values as racism, war, militarism, the *Führerprinzip*, and imperialism. These critical sources tend, however, to base their arguments on inferior quality German science fiction, like that in the Perry Rhodan series. They fail to examine in depth the high-calibre contributions offered by such authors as Kurd Lasswitz and Thea von Harbou.

[18] Such puerile science fiction includes works in the post-1945 Perry Rhodan series from Germany, as well as that trite American literature based on such characters as Buck Rogers, Flash Gordon, and Superman. Unlike our German science fiction, this trivial literature does not qualify for technological utopian status.

[19] Other critics, including Treguboff (pp. 24-25), Swoboda (p. 36), Schwonke, Vom Staatsroman zur Science Fiction (pp. 11-12, 45-47, 77, 87, 170, passim), J. Asimov (pp. 114, 119), and Joseph Kostolefsky, "Science, Yes--Fiction, Maybe," Antioch Review 13 (1953-54): 236-40, also concede that science fiction works can differ radically in the quality of their content, and thereby can represent various levels ranging from the trite to the significant. In addition to the first or high-calibre level, and the third or trivial level, this author also recognizes a second level of science fiction, found especially within the medium of film, and one that, while cinematographically or technically valuable (Star Wars), is of little cultural or historical value in itself or contentwise.

[20] Karl Mannheim, Ideology and Utopia, foreward by Louis Wirth and Edward Shils, preface by Louis Wirth (London: Routledge and Kegan Paul, 1936; paperback ed., 1976), p. 2.

[21] It is notable, of course, that no less than Plato, Andreae, or Wells, our modern German science fiction authors emphasized a quality of science and scientific research important in their time. While Plato, as an ancient Greek, stressed philosophy and logic rather than the application of the scientific method, the modern German writers focused on the application of theory, in particular rocket theory. Significantly, moreover, this literary emphasis mirrored and pandered to the German governments' priority to rocket development and physics research.

[22] Mannheim's liberal-humanitarian tradition is restricted to post-seventeenth century socio-political utopias, thereby excluding Plato's thought and modern German science fiction. (Ideology and Utopia, passim). Bloch classifies Plato in his utopian tradition of order (Ordnung) rather than freedom (Freiheit) (Prinzip Hoffnung, 2:566), and looks disparagingly on science fiction, claiming that utopian themes only tepidly extend into this new genre (A Philosophy, p. 88). He further maintains that science fiction is not part of his utopian tradition of freedom (Freiheit), yet suggests that Two Planets by Kurd Lasswitz and The Time Machine by H. G. Wells, as Märchen, are in this tradition (A Philosophy, p. 88; Prinzip Hoffnung, 2:734). We, however, have attempted to contradict Bloch and show that Two Planets (like The Time Machine), is more than just Märchen. We have suggested instead that it is one of many high-calibre German science fiction works that, like certain works by Plato, qualifies as technological utopian literature in Bloch's tradition of Freiheit (as well as Mannheim's liberal-humanitarian tradition).

[23] Far from presenting the theme and image of a "mad-scientist," found in some science fiction [Peter Alterman, "A Study of Four Science Fiction Themes and their Function in Two Contemporary Novels" (Ph.D. dissertation, University of Denver, 1974), pp. 7-44, esp. pp. 23 ff.], our early and modern technological utopists regarded the scientists as highly responsible and, albeit naively, trusted the elites, whether scientific, religious, or academic, to behave responsibly.

[24] The technological utopian thinkers did exhibit a naiveté, at times, regarding the dual or positive and negative nature of both science and progress. Only the modern English dystopian tradition (Aldous Huxley's Brave New World, George Orwell's Nineteen Eighty-Four, and H. G. Wells's The Shape of Things to Come) displayed, probably due to the negative experiences resulting from a relatively long English history of industrialization and technological change, a mature and acute awareness of the problems and threats to social and environmental welfare of unimpeded technological growth.

[25] Howard P. Segal, "Technological Utopianism and American Culture, 1830-1940" (Ph.D. dissertation, Princeton University, 1975), pp. 1-2.

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TABLE I

TABLE I

MODEL OF
TECHNOLOGICAL UTOPIANISM

A. Principles
  1. External
    a) Sociology of Knowledge

  2. Internal
    a) Liberal-humanitarian Tradition
    b) Freedom
    c) Progress--Hope
      i) Future goals

B. Process
  1. Historical Change

  2. Intellectual Continuity

C. Philosophy. Technologically-orientated Society as Essentially Progressive and Dynamic
  1. Relations or attitudes supporting it
  To: a) women
    b) elites (scientific and political)
    c) science (theoretical and applied)
    d) politics (interregional and international)